

## CHAPTER I: FOOTNOTES

1. Biographical information about Colonel Richard Gridley is provided in Raleigh B. Buzzard, "America's First Chief Engineer," *Military Engineer*, XXIX (December, 1947), 505-10. An older administrative history of the Corps of Engineers is W. Stull Holt, *The Office of the Chief of Engineers of the Army: Its Non-Military History, Activities, and Organization* (Baltimore, 1923; cited hereinafter as Holt, OCE); and sketches of various aspects and periods of Corps history are found in Henry P. Beers, "A History of the U. S. Topographical Engineers, 1813-1863," *Military Engineer*, XXXIV (June-July, 1942), 287-91, 348-52; Edward Burr, "Historical Sketch of the Corps of Engineers, U. S. Army," *Occasional Papers: The Engineer School*, No. 71 (1939); William P. Craighill, "Corps of Engineers, United States Army," *Transactions of the American Society of Civil Engineers*, VIII (1897), 429-35; Henry C. Jewett, "History of the Corps of Engineers to 1915," *Military Engineer*, XIV (September-October, November-December, 1922), 304-06, 385-88; and A. A. Humphreys, "Historical Sketch of the Corps of Engineers," in U. S., Congress, House, *Reorganization of the Army*, H. Rept. 555, 45 Cong., 3 Sess., 1878, pp. 327-49.
2. A highly readable general account of the history of the Ohio Valley is Richard E. Banta, *The Ohio* (New York, 1949). Discussions of the explorations of La Salle are found in Thomas D. Clark, *Kentucky: Land of Contrast* (New York, 1968), and Frances Krauskopf, "The Documentary Basis for LaSalle's supposed Discovery of the Ohio River," *Indiana Magazine of History*, XLVII (June, 1951), 143-53. Krauskopf concludes that "LaSalle had no first-hand knowledge of the Ohio;" *ibid.*, p. 153.
3. A reliable general account of the use of the Ohio Valley waterways for commerce is Charles H. Ambler, *A History of Transportation in the Ohio Valley* (Glendale, Calif., 1932; cited hereinafter as Ambler, *Transportation in Ohio Valley*); see pp. 1-29 for discussion of the "Canoe Age."
4. In addition to Salley, members of the expedition were John Howard, John Poteat, and Charles Sinckler. See the account of the voyage and pertinent documents in Fairfax Harrison, "The Virginians on the Ohio and the Mississippi in 1742," *Virginia Magazine*, XXX (April, 1922), 203-22 (the description of the Falls of the Ohio is printed on p. 214).
5. Jack L. Holmes, "Some French Engineers in Spanish Louisiana," and Samuel Wilson, Jr., "Colonial Fortifications and Military Architecture in the Mississippi Valley," in John F. McDermott, ed., *The French in the Mississippi Valley* (Urbana, Ill., 1965), 103-22, 123-42, are scholarly discussions of French Engineers; see also R. E. Banta, *The Ohio*, p. 60, and Emerson W. Gould, *Fifty Years on the Mississippi* (St. Louis, 1889), pp. 224, 310.
6. General accounts of the action at the Forks of the Ohio during the French and Indian War, which include discussions of the roles of Captain Le Mercier and George Washington, are Charles Morse Stotz, *Point of Empire: Conflict at the Forks of the Ohio* (Pittsburgh, 1970); Charles Morse Stotz and Alfred Procter James, *Drums in the Forest* (Pittsburgh, 1958); and Walter O'Meara, *Guns at the Forks* (Englewood Cliffs, N. J., 1965).
7. Nicholas Wainwright, *George Croghan, Wilderness Diplomat* (Chapel Hill, 1959; cited hereinafter as Wainwright, *Croghan*), pp. 91-93, describes the activities of Gage, Washington, Croghan, and Gordon in 1755.
8. George Washington to President of Congress, December 14, 1784, in John C. Fitzpatrick, ed., *The Writings of George Washington*, XXVIII (Washington, D. C., 1938), 11. The support of General Washington for the training of American military engineers, for free navigation, and for internal improvements may be traced in this multivolume printing of his works; most biographies of Washington also discuss his opinions on these subjects.
9. Thomas Jefferson, *Notes on the State of Virginia* (Philadelphia, 1801), pp. 15-18.
10. Johann D. Schoepf, *Travels in the Confederation* [1783-1784], trans. by Alfred J. Morrison (Philadelphia, 1911); "Journal of Arthur Lee," in John W. Harpster, ed., *Pen Pictures of Early Western Pennsylvania* (Pittsburgh, 1938), p. 155; "News from the Ohio," in *Ohio Archaeological and Historical Publications*, XLV (1936), 371-73.
11. The authoritative biography of Thomas Hutchins is Anna Margaret Quattrocchi, "Thomas Hutchins, 1730-1789" (unpublished Ph.D. dissertation, University of Pittsburgh, 1944; cited hereinafter as Quattrocchi, "Hutchins").
12. Letter from General Forbes' Army, Pittsburgh, November 28, 1758, in S. K. Stevens, Donald H. Kent, and Autumn L. Leonard, es., *The Papers of Henry Bouquet: Vol. II The Forbes Expedition* (Harrisburg, 1951), p. 613. Hutchins served as quartermaster in this expedition.
13. Quattrocchi, "Hutchins," pp. 50-67; Wainwright, *Croghan*, pp. 167-94.
14. Quattrocchi, "Hutchins," pp. 68-76; Wainwright, *Croghan*, pp. 220-23.
15. Thomas Gage to Harry Gordon, May 9, 1766, William L. Clements Library, University of Michigan.
16. *Ibid.*
17. Ambler, *Transportation in Ohio Valley*, pp. 32-33; Wainwright, *Croghan*, pp. 233-35; Quattrocchi, "Hutchins," pp. 79-83.
18. Wainwright, *Croghan*, pp. 212-14, 233-35; Quattrocchi, "Hutchins," pp. 79-83. The most interesting first-hand account of the voyage is George Morgan to Molley, June 20-28, 1766, Manuscript Section, Illinois Historical Survey.
19. The journal kept by Captain Gordon during the expedition has been reprinted several times; see *Journal of Illinois State Historical Society*, II (1909), 55-64 (description of the Falls of the Ohio on p. 58).
20. Beverly Bond, Jr., ed., *The Courses of the Ohio River taken by Lt. T. Hutchins, Anno 1776, and Two Accompanying Maps* (Cincinnati, 1942). Bond states that Hutchins' map of the Falls of the Ohio "was of greatest importance in opening up this difficult stretch of water to navigation;" *Ibid.*, p. 13. Thomas Hutchins Papers, 1759-88, are in Historical Society of Pennsylvania, Philadelphia.
21. The 60th "Royal American" Regiment of Foot was organized during the French and Indian War by the Earl of Loudoun, and especially distinguished itself at the Battle of Quebec. During the American Revolution it served in the West Indies; it became the first British unit to be armed with rifles, rather than muskets, and the first to use the green uniform to reduce visibility in combat. In the twentieth century it became known as the King's Royal Rifle Corps. Refer to Emil John Ruckert, "Governors Island and the Royal American Regiment," *Journal of the American Military History Foundation*, I (Fall, 1937), 130-31. Discussion and description of the second trip down the Ohio and the construction of the Gage may be located in Quattrocchi, "Hutchins," pp. 95-98; "Affairs at Fort Chartres, 1768-1781," *The Historical Magazine*, VIII (August, 1864), 258-63; Clarence Alvord and Clarence E. Carter, eds., *Trade and Politics, 1767-1769* (Springfield, Ill., 1921); and the escape of Hutchins is mentioned in Clarence E. Carter, ed., *The Correspondence of General Thoms Gage with the Secretaries of State, 1763-1775* (2 vols; New Haven, 1931), I, 309.
22. Thomas Hutchins, *A Topographical Description of Virginia, Pennsylvania, Maryland, and North Carolina*, edited by Frederick C. Hicks (reprint of 1778 London edition; Cleveland, 1904). This edition prints a bibliography of Hutchins' works and related materials and a biography of Hutchins by Frederick C. Hicks, but the latter is superceded by Quattrocchi, "Hutchins." Quattrocchi states the contem-

poraries of Hutchins credited him with laying the foundation for American geography; see p. 347.

23. Quattrocchi, "Hutchins," pp. 201-02. Copies of Hutchins' correspondence with Wharton are in British Transcripts, Manuscript Division, Library of Congress. The recommendation from Franklin stated that Hutchins, "a native of New Jersey . . . has lately escaped from England where he suffered considerably for his attachment to the American cause." He is, said Franklin, a "good officer and an excellent engineer." Benjamin Franklin to President of Congress, March 16, 1780, in John Bigelow, ed., *The Works of Benjamin Franklin*, VIII (New York, 1904), 203-04. The claim that Hutchins was the first Chief of Topographical Engineers was made in Edward Burr, "Historical Sketch of the Corps of Engineers, U. S. Army," *Occasional Papers: The Engineer School*, No. 71 (1939), p. 34. James A. James, *The Life of George Rogers Clark* (Chicago, 1928), pp. 394-95, describes the Hutchins-Morgan colonizing attempt at New Madrid.

24. Burr, "Historical Sketch of the Corps of Engineers, U. S. Army," p. 1.

25. Raleigh B. Buzzaird, "Washington's Favorite Engineer," *Military Engineer*, XL (March, 1948), 115-18.

26. Burr, "Historical Sketch of the Corps of Engineers, U. S. Army," p. 1; A. A. Humphreys, "Historical Sketch of the Corps of Engineers," in U. S., Congress, House, *Reorganization of the Army*, H. Rept. 555, 45 Cong., 3 Sess., 1878, pp. 327-332. A scholarly study of the organization and activities of the Corps of Artillerists and Engineers, 1794-1802, would be a valuable addition to the history of the United States and would shed considerable light on the history of the Ohio Valley frontier.

27. Dwight L. Smith, ed., "The Ohio River in 1801: Letters of Jonathan Williams, Junior," *Filson Club Historical*

*Quarterly*, XXVII (July, 1953), 199-222, prints a biography of Williams and his correspondence while on assignment in the Ohio Valley.

28. *Ibid.*

29. *Ibid.*, p. 207.

30. *Ibid.*, pp. 211-12.

31. *Ibid.*; see also Norman W. Caldwell, "Cantonment Wilkinsonville," *Mid-America*, XXXI (January, 1949), 3-28.

32. James McHenry to House of Representatives, January 31, 1800, printed as House Document No. 40, 6 Cong., 1 Sess., 1800.

33. Holt, OCE, pp. 12; Corps of Engineers Museum [Fort Belvoir, Va.], *Geneses of the Corps of Engineers* (unpaginated pamphlet; Fort Belvoir, 1953), provides biographical information and a portrait of Jonathan Williams.

34. Holt, OCE, p. 3; A. A. Humphreys, "Historical Sketch of the Corps of Engineers," *passim*. The duties of the Topographical Engineers, as described in the Rules and Regulations of the Army in 1813, were: "To make such surveys, and exhibit such delineation of these, as the commanding General shall direct; to make plans for all military positions (which the Army may occupy) and of their respective vicinities, indicating the various roads, rivers, creeks, ravines, hills, woods, and villages to be found therein; to accompany all reconnoitering parties sent out to obtain intelligence of the movements of the enemy . . ."

35. See the excellent work of William H. Goetzmann in *Army Exploration in the American West, 1803-1863* (New Haven, 1959), and *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York, 1966). His studies constitute, in aggregate, a major revision of the Turner "frontier thesis," insofar as it applies to the American frontier west of the Mississippi.

## CHAPTER II: FOOTNOTES

1. Descriptions of the unimproved Ohio River written by waterways engineers who were well acquainted with the subject and made precise measurements may be located in William L. Sibert, "The Improvement of the Ohio River," *Transactions of the American Society of Civil Engineers*, LXIII (June, 1909), 391; and Robert R. Jones, "The Ohio River: A Brief Account of the Considerations which Led to the Present Project for Its Canalization" (unpublished 30 page manuscript, dated Cincinnati, March 27, 1922, in National Archives, Record Group 77, Records of the Office of the Chief of Engineers, at Kansas City Federal Records Center, Box NA1141, Folder—Ohio 450). General Sibert served as Louisville and Pittsburgh District Engineer at the beginning of the twentieth century; Robert R. Jones was Assistant Engineer in the Louisville and Cincinnati Engineer Districts for many years and surveyed many sections of the Ohio River before it was canalized. Records of the Office of the Chief of Engineers, Record Group 77, National Archives, are cited hereinafter as NA, RG 77.

2. The effects of seasonal navigation on economic activities in the Ohio Valley are discussed in Louis C. Hunter, *Studies in the Economic History of the Ohio Valley*, Vol. XIX: *Smith College Studies in History* (Northampton: Smith College History Department, 1933-34), pp. 5-23.

3. *Ibid.*

4. Dale Van Every, *Ark of Empire: The American Frontier, 1784-1803* (New York, 1963), discusses Ohio River flatboat traffic and its relation to the settlement of the frontier; hundreds of descriptions of flatboats and their navigation are available, both in print and in manuscripts preserved in libraries in the Ohio Valley. The description

quoted is from Francois A. Michaux, *Travels to the West of the Alleghany Mountains*, reprinted in Reuben G. Thwaites, ed., *Early Western Travels*, Vol. III (Cleveland, 1904), 166.

5. Van Every, *Ark of Empire: The American Frontier, 1784-1803*, p. 35-36; John W. Harpster, ed., *Pen Pictures of Early Western Pennsylvania* (Pittsburgh, 1938), pp. 257-58, 265-67.

6. Guillaume Tell Poussin, *The United States: Its Power and Progress*, trans. by Edmund L. Du Barry (1st American edition; Philadelphia, 1851), p. 348. This volume is a history of the United States written by Captain Poussin after his return to France in 1832. He served in the Corps of Engineers from 1817 to 1832, and later served France as Ambassador to the United States. Poussin traveled the Ohio in a flatboat in 1817 and surveyed the river in 1821. He also implied that he had navigated the Ohio in 1806.

7. W. Wallace Carson, "Transportation and Traffic on the Ohio and the Mississippi before the Steamboat," *Mississippi Valley Historical Review*, VII (June, 1920), 33-35.

8. Mary Verhoeff, *The Kentucky River Navigation, Filson Club Publications*, No. 28 (Louisville, 1917), p. 53n. The history of the Tardiveau and Holker enterprises and pertinent documents are printed in "News From the Ohio Valley as Reported by Barthélemi Tardiveau in 1783," *Bulletin of the Historical and Philosophical Society of Ohio*, XVI (October, 1958), 267-92.

9. Walker Daniel to B. Tardiveau, February 22, 1783, and John May to B. Tardiveau, February 18, 1783, in "News from the Ohio Valley as Reported by Barthélemi Tardiveau in 1783," *Bulletin of the Historical and Philosophical Society of Ohio*, XVI (October, 1958), 281

285.

10. *Ibid.*, pp. 282-84.11. *Ibid.*, pp. 288-89. Pierre Tardiveau settled near Bowling Green, Kentucky, in 1798 and died there in 1835. See Thomas C. Cherry, "Robert Craddock and Peter Tardiveau: Two Revolutionary Soldiers of Warren County, Kentucky," *Filson Club History Quarterly*, IV (April, 1930), 78-90.12. Verhoeff, *The Kentucky River Navigation*, pp. 55-58.13. Thomas D. Clark, *The Kentucky* (New York, 1942), Rivers of America series edited by Stephen Vincent Benet and Carl Carmer, pp. 54-63; Ambler, *Transportation in Ohio Valley*, pp. 72-73, Harlow Lindley, ed., *Indiana as Seen by Early Travelers*, Vol. III of *Indiana Historical Collections* (Indianapolis, 1916), pp. 31-32; Niles' *Weekly Register*, I (September 7, 1811), 10.14. Consult James A. James, *Life of George Rogers Clark* (Chicago, 1928), for extensive details. An excellent military analysis of the Clark expedition is Joseph L. Lambert, "Clark's Conquest of the Northwest," *Indiana Magazine of History*, XXXVI (December, 1940), 337-50.15. Verhoeff, *The Kentucky River Navigation*, pp. 68-69; Ambler, *Transportation in Ohio Valley*, p. 71; Henry McMurtrie, *Sketches of Louisville and Its Environs* (Louisville, 1819), pp. 155-57; Archer B. Hulbert, *The Paths of Inland Commerce: A Chronicle of Trail, Road, and Waterway* (New Haven, 1920), in *Chronicles of America Series* edited by Allen Johnson, pp. 74-75. A scholarly study of customs collection and the creation of ports of entry on the inland rivers would be a valuable addition to American transportation and taxation history, for the sources listed above often conflict.16. Ambler, *Transportation in Ohio Valley*, pp. 97-106; Richard T. Wiley, "Ship and Brig Building on the Ohio and Its Tributaries," *Ohio Archaeological and Historical Publications*, XXII (1913), 54-64.17. Doyce B. Nunis, Jr., "Tarascon's Dream of an American Commercial Empire in the West," *Mid-America*, XLII (July, 1960), 170-84, is a scholarly and interpretative study of the firm and the life of Louis Tarascon.18. Leland D. Baldwin, "Shipbuilding on the Western Waters, 1793-1817," *Mississippi Valley Historical Review*, XX (June, 1933), 29-34; Ambler, *Transportation in Ohio Valley*, pp. 97-106.19. Leland D. Baldwin, *The Keelboat Age on Western Waters* (Pittsburgh, 1941), pp. 1-45. Though many studies of inland river navigation have touched on the subject of keelboats, the Baldwin volume is the definitive work.20. *Ibid.*, pp. 44-45. The description of the superstructure of the keelboat was written by Noah Ludlow, a traveling theatrical troupe manager who owned and journeyed on many keelboats; see Noah M. Ludlow, *Dramatic Life as I Found It* (New York, 1966), p. 55.21. Baldwin, *The Keelboat Age on Western Waters*, pp. 62-64; see also the contemporary account in Timothy Flint, *Recollections of the Last Ten Years* (New York, 1968), pp. 24-25; 91-92.22. The claims and comments of General Wilkinson were printed in *Proceedings of the Managers of the Ohio Canal Company at Louisville on Wednesday, the 11th Day of September, 1805* (pamphlet; Lexington, 1805), p. 12.23. Robert R. Jones, "The Ohio River" (unpublished 125 page manuscript, dated 1920; NA, RG 77, in Kansas City Federal Records Center, Box NA1141, Folder—Ohio 450), p. 9; Elias Pym Fordham, *Personal Narrative of Travels . . . 1817-1818* (Cleveland, 1906), pp. 121-22, provides information on keelboat management; additional information about the economics of the keelboat is furnished in *S&D Reflector*, V (June, 1968), 10.

24. Carson, "Transportation and Traffic on the Ohio and the Mississippi before the Steamboat," pp. 32-33. Cave-in-Rock and Fort Massac are now the sites of Illinois state

parks. Several accounts of the activities of the pirates and boatwreckers have been written, but those interesting stories are beyond the scope of this narrative. Robert R. Jones of the Louisville and Cincinnati Engineer Districts carefully explored the Cave-in-Rock in 1912 and made some interesting discoveries; at that time the famous Cave was used as a shipyard where small boats were built and launched into the Ohio.

25. Fordham, *Personal Narrative of Travels . . . 1817-1818*, pp. 195-96; see also remarks of Morris Birkbeck printed in Lindley, ed., *Indiana as Seen by Early Travelers*, p. 176.26. John Q. Anderson, "Up Salt Creek Without a Paddle," *Register of Kentucky State Historical Society*, LIV (April, 1956), 147-52; John James Audubon, "Sailing Down the Ohio," *Family Magazine*, I (1836), 72.27. Ambler, *Transportation in Ohio Valley*, pp. 48-49; Miles A. Stacy, "Flatboating from Marietta to New Orleans Described," *S&D Reflector*, VI (December, 1969), 27-28; Baldwin, *The Keelboat Age on Western Waters*, pp. 193-95; see also Louisville *Courier-Journal*, October 29, 1929, which prints a photograph of a flatboat and its story — it traveled down the Ohio in 1898.28. Arthur E. Hopkins, "Steamboats at Louisville and on the Ohio and Mississippi Rivers," *Filson Club History Quarterly*, XVII (July, 1943), 143-62; Thomas D. Clark, *Kentucky: Land of Contrast* (New York, 1968), pp. 35, 65-68; Louis C. Hunter, *Steamboats on the Western Rivers: An Economic and Technological History* (Cambridge, Mass., 1949), pp. 1-62. Hunter's history is definitive on most aspects of steamboat history. An invaluable tool for the study of steamboat history is the *S&D Reflector* published by the Sons and Daughters of Pioneer Rivermen and edited by Captain Frederick Way, Jr., of Sewickley, Pennsylvania. More than eight volumes have thus far been published. Trade Journals, such as *Waterways Journal*, can also be of use, but lack adequate indexes.29. Verhoeff, *The Kentucky River Navigation*, p. 96n; C. W. Hackensmith, "John Fitch: A Pioneer in the Development of the Steamboat," *Register of the Kentucky State Historical Society*, LXV (July, 1967), 187-211.30. Quattrocchi, "Hutchins," p. 351; John Fitch to Thomas Hutchins, June 15, 1787, and January 27, 1788, in John Fitch Papers, Manuscript Division, Library of Congress; comments of George Washington, dated September 7, 1784, on the Rumsey boat are also in Volume I of *ibid.*31. Thomas D. Clark, *The Kentucky*, pp. 156-60; Ambler, *Transportation in Ohio Valley*, pp. 111-24; John H. B. Latrobe, *The First Steamboat Voyage on the Western Waters* (Baltimore, 1871), pp. 16-22.32. Ambler, *Transportation in Ohio Valley*, pp. 124-29.33. Several biographies of Captain Shreve have been published, but the most useful to date is Florence L. Dorsey, *Master of the Mississippi: Henry Shreve and the Conquest of the Mississippi* (Boston, 1941; cited hereinafter as Dorsey, *Master of the Mississippi*). Henry McMurtrie, *Sketches of Louisville and Its Environs*, pp. 194-97.34. McMurtrie, *Sketches of Louisville and Its Environs*, pp. 194-97, 201; Hunter, *Steamboats on the Western Rivers*, pp. 15, 133. Hunter believed that Shreve's contributions to steam navigation have at times been "overstated."35. Edwin A. Davis and John C. L. Andreassen, eds., "From Louisville to New Orleans in 1816: Diary of William Newton Mercer," *Journal of Southern History*, II (1936), 393-94. Mercer was a passenger on the *Washington* on its first trip. See also Hunter, *Steamboats on the Western Rivers*, pp. 17-20.36. Richard G. Wood, *Stephen Harriman Long, 1784-1864: Army Engineer, Explorer, Inventor* (Glendale, Calif., 1966), pp. 59-84. This is the authoritative biography of Long; cited hereinafter as Wood, *Long*.37. *Ibid.*; Hunter, *Steamboats on the Western Rivers*, p.

150; Roger L. Nichols, "Army Contributions to River Transportation, 1818-1825," *Military Affairs*, XXXIII (April, 1969), 242-49; John T. Starr, "Long's Expedition to the West," *Military Engineer*, LIII (March April, 1961), 116-18. The claim has been made that the *Western Engineer* was the first sternwheel steamboat, but see Frederick Way, Jr., "Early Sternwheelers Were Not Sternwheelers," *Cincinnati Historical Bulletin*, XIII (October, 1955), 295-301.

38. *Pittsburgh Mercury*, April 30, 1819.

39. *Louisville Public Advertiser*, May 22, 1819. Other scientists and Engineer officers were also involved in the expedition in various capacities; see Wood, *Long*, pp. 59-84.

40. Stephen H. Long to John C. Calhoun, February 20, 1821 (report on the expedition in a bound volume), pp. 106-07, NA, RG 77.

41. *Ibid.*, pp. 11-12. See the discussion of the duration and effect of the low-water period of 1819-20 in Chapter III, *infra*.

42. Hunter, *Steamboats on the Western Rivers*, pp. 25-26; Theodore G. Gronert, "Trade in the Blue-Grass Re-

gion, 1810-1820," *Mississippi Valley Historical Review*, V (December, 1918), 317-23.

43. McMurtrie, *Sketches of Louisville and Its Environs*, p. 193; Timothy Flint, *Recollections of the Last Ten Years*, p. 377. *Louisville Public Advertiser*, March 6, 1819, printed an editorial on the subject: "It is highly gratifying to witness the rapid progress of the western country in wealth and national importance. It has been but eight years since the first steam boat was launched . . . and before the close of 1819, the number employed in the trade . . . will . . . exceed one hundred!"

44. Hunter, *Steamboats on the Western Rivers*, pp. 33-34, 105-08, 123; Ambler, *Transportation in Ohio Valley*, pp. 160-61; McMurtrie, *Sketches of Louisville and Its Environs*, pp. 127-32. Several studies of steamboat construction at individual ports have been published; see, for example, Victor M. Bogle, "New Albany's Attachment to the Ohio River," *Indiana Magazine of History*, XLIX (September, 1953), 250-66.

45. Poussin, *The United States: Its Power and Progress*, p. 350; see also Timothy Flint, *Recollections of the Last Ten Years*, p. 107.

### CHAPTER III: FOOTNOTES

1. Holt, *OCE*, pp. 4-5; Victor L. Albjerg, "Internal Improvements without a Policy," *Indiana Magazine of History*, XXVIII (June, 1932), p. 168.

2. George Washington to Governor William Moultrie, May 25, 1786, in John C. Fitzpatrick, ed., *The Writings of George Washington*, Vol. XXVIII (Washington: Government Printing Office, 1938), 439. Summaries of the views of the Presidents, 1789-1860, are provided in Victor L. Albjerg, "Internal Improvements without a Policy," *passim*; and William R. Willoughby, "Early American Interest in Waterway Connections between the East and West," *Indiana Magazine of History*, LII (December, 1956), 319-42.

3. *Kentucky Gazette* (Lexington), July 6, 1801, prints the act signed by Adams on March 3, 1801, Holt, *OCE*, pp. 4-5.

4. Report of Secretary of Treasury on "Roads and Canals," April 6, 1808, in U. S., Congress, *American State Papers*, Class X: *Miscellaneous* (2 vols.; Washington: Gales and Seaton, 1834), I, 724-921. *American State Papers* is a convenient multivolume printing of early government documents; it is cited hereinafter as ASP. The remarks of Congressman Peter Porter in support of internal improvements are of great interest; see *Annals of Congress*, 11th Congress, 2 Session, February 8, 1810, 1385-1401.

5. *Louisville Public Advertiser*, January 5, 1822; *Niles' Weekly Register*, IX (November 18, 1815), 202, said: "The exigencies of the nation, during the late war, has raised up an astonishing zeal in all parts of the United States, to secure all those advantages of roads, bridges and canals, & c. which our country so happily presents to us." See also Bereton Greenhouse, "A Note on Western Logistics in the War of 1812," *Military Affairs*, XXXIV (April, 1970), 41-44.

6. The report of the Board of Engineers for Fortifications, February 15, 1881, is printed in ASP, Class V: *Military Affairs*, II, 305; Guillaume Tell Poussin, *The United States: Its Power and Progress*, pp. 376-79.

7. Report of Secretary of War on "Roads and Canals," January 14, 1819, is printed in ASP, Class X: *Miscellaneous*, II, 533-37 (quote on p. 534).

8. *Niles' Weekly Register*, XV (December 12, 1818), 267; Joseph Proud to Nathaniel G. Maxwell, December 22, 1819, in William D. Hoyt, Jr., ed., "From Pittsburgh to Shawneetown, 1819," *Ohio Archaeological and Historical*

*Publications*, LVI (1947), 94-97; *Louisville Public Advertiser*, February 1 and 2, 1820.

9. *Louisville Public Advertiser*, October 13, 1819, and January 5, 8, 1820. "Reconnaissance of the Ohio River above the Falls Made in 1819 by Commissioners Appointed by the States of Virginia, Kentucky, Pennsylvania, and Ohio," November 2, 1819. This original manuscript and accompanying maps was located in the files of the Louisville Engineer District in 1966; see *Louisville Times*, July 16, 1966, for an account of the rediscovery of the papers. Copies were made and placed on file at a number of libraries in the Ohio Valley.

10. *Niles' Weekly Register*, XIX (November 11, 1820), 170. Information about the Pennsylvania project is furnished in *Pittsburgh Post Gazette*, October 21, 1824, and James St. Clair Morton, *Memoir of the Life and Services of Capt. and Brevet Major John Sanders* (Pittsburgh: W. S. Haven 1861), pp. 8-9.

11. See remarks of President James Monroe, January 22, 1823, in U. S., Congress, House, *Message from the President of the United States transmitting a Report of the Board of Engineers on the Ohio and Mississippi Rivers, Made in the Year 1821*, H. Ex. Doc. No. 35, 17 Cong., 2 Sess., 1823, p. 3, and the accompanying report. *Louisville Public Advertiser*, June 6, 1821, and October 13, 1821. Biographical information is located in William H. Carter, "Bvt. Maj. Gen. Simon Bernard," *Professional Memoirs*, V (May-June, 1913), 306-14; Cyrus B. Comstock, "General Joseph G. Totten, Hon. M. ASCE," *Transactions of the American Society of Civil Engineers*, XXXVI (December, 1896), 525-27. Two of Captain Poussin's excellent histories are *The United States: Its Power and Progress* (previously cited), and *Travaux d'Améliorations Intérieures, Projetés ou Exécutés par le Gouvernement Général des Etats-Unis d'Amérique de 1824 à 1831* Paris: Anselin, Libraire, 1834).

12. *Louisville Public Advertiser*, October 23, 1821.

13. General Alexander Macomb to John C. Calhoun, November 14, 1822, in ASP, Class V: *Military Affairs*, II, 458. The recommendations of the board are printed in U. S., Congress, House, *Message from the President of the United States Transmitting a Report of the Board of Engineers on the Ohio and Mississippi Rivers, Made in the Year 1821*, H. Ex. Doc. No. 35, 17 Cong., 2 Sess., 1823. The maps prepared

by the Board are on microfilm at Surveys Branch, Louisville Engineer District.

14. Curtis Nettels, "The Mississippi Valley and the Constitution, 1815-1829," *Mississippi Valley Historical Review*, XI (December, 1924), 332-38; *Louisville Public Advertiser*, May 2, 1821.

15. See remarks of Rep. Holcombe of New Jersey, January 13, 1824, in *Annals of Congress*, 18 Cong., 1 Sess., 1021, and subsequent debates over the issues relating to internal improvements during that session of Congress.

16. See comments of Congressman Wickliffe printed in *Louisville Public Advertiser*, June 2, 1824.

17. Henry Clay, "Speech on Internal Improvements," January 14, 1824, printed in James F. Hopkins and Mary W. M. Hargreaves, eds., *The Papers of Henry Clay*, Vol. III: *Presidential Candidate, 1821-1824* (Lexington: University of Kentucky, 1963), pp. 572-93; *Washington Daily National Intelligencer*, July 31, 1824; *Annals of Congress*, 18 Cong., 1 Sess., 2578-83.

18. A convenient printing of most legislation relating to the Corps of Engineers and the improvement of waterways is United States Army, Office of the Chief of Engineers, *Laws of the United States Relating to the Improvement of Rivers and Harbors, from August 11, 1790 to January 2, 1939* (3 vols. and 2 indices; Washington, 1913 and 1940). Volume I, pp. 26-28, prints the General Survey Act and the first Rivers and Harbors Act. This work is cited hereinafter as *Rivers and Harbors Laws*.

19. Holt, *OCE*, pp. 5-9; ASP, Class X: *Miscellaneous*, II, 533-37; ASP Class V: *Military Affairs*, II, 698-701; *Annals of Congress*, 18 Cong., 1 Sess., 2558. A history of the activities of the Board of Internal Improvements is provided by Forest G. Hill, *Roads, Rails & Waterways* (Norman, 1957).

20. Wood, Long, pp. 145-46; U. S., Congress, House, *Sand Bars of the Ohio River*, H. Ex. Doc. No. 145, 19 Cong., 1 Sess., 1826.

21. *Ibid.*, U. S. Congress, Senate, *A Report of the Chief Engineer Relative to the Application of the Appropriations for Removing Obstructions to the Navigation of the Ohio and Mississippi Rivers*, S. Doc. No. 14, 19 Cong., 1 Sess., 1826, pp. 28-31; W. T. Rossell to Alexander Mackenzie, November 6, 1906, in Vol. III of "Ohio River Board Records" (3 bound volumes of correspondence, minutes, and misc. materials; Kansas City Federal Records Center, NA, RG 77), iii, n. p. Major Long warned navigation interests that construction was in progress and advised that the structure would be marked by white flags in daytime and red lanterns at night; *Louisville Public Advertiser*, November 6, 1824. See Comments on the success of the experiment in *Louisville Public Advertiser*, November 23, 1825, and February 25, 1826. The latter issue stated: "The result of this experiment cannot but be highly satisfactory to the learned and scientific gentlemen, under whose direction the work has been performed. If we can have four feet water, or three either in the Ohio river, at all seasons, a new era will commence, in its navigation, which will throw all other conveyance in the shade . . ."

22. Elias Pym Fordham, *Personal Narrative of Travels in Virginia, Maryland, Pennsylvania, Ohio, Indiana, Kentucky: And of a Residence in the Illinois Territory, 1817-1818*, edited by Frederic A. Ogg (Cleveland, 1906), pp. 81-82; Henry Vose to John C. Calhoun, August 19, 1824, "Plans for Removal of Obstructions in the Mississippi and Ohio Rivers, 1824-1825," NA, RG 77 (this collection cited hereinafter as "Plans for Removal," NA, RG 77).

23. *Louisville Public Advertiser*, June 19, 1824.

24. "Plans for Removal," NA, RG 77; Charles De Hass to John C. Calhoun, August 17, 1824, *ibid.* Emerson Gould, *Fifty Years on the Mississippi*, p. 193, mentions that United States troops frequently ascended the Ohio in boats similar to ferry-flats, propelled by men walking a tread-wheel.

25. See the proposed devices and accompanying diagrams

in "Plans for Removal," NA, RG 77.

26. *Louisville Public Advertiser*, June 19, 1824; "Plans for Removal," NA, RG 77; Samuel McKee to John C. Calhoun, August 31, 1824, *ibid.*

27. John Bruce was distantly related to Congressman Henry Clay; he served in the Kentucky legislature in 1827 and 1829 as a Whig. Among the recommendations he took with him to Washington was one from Henry Clay, which said in part: "I take great pleasure in expressing my belief that entire confidence may be placed in his faithful execution of any contract that he may make with Government for that purpose." Henry Clay to John C. Calhoun, August 15, 1824, in Hopkins and Hargreaves, eds., *The Papers of Henry Clay*, III, 810. This John Bruce should not be confused with the Lexington manufacturer of the same name who was also associated with Henry Clay. Contract negotiations may be traced in John Bruce to John C. Calhoun, August 31, and September 3, 1824, "Plans for Removal," NA, RG 77; Alexander Macomb to John Bruce, September 23, 1824, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77.

28. The contract is printed in U. S., Congress, Senate, *A Report of the Chief Engineer Relative to the Application of the Appropriation for Removing Obstructions to the Navigation of the Ohio and Mississippi Rivers*, S. Doc. No. 14, 19 Cong., 1 Sess., 1826, pp. 7-8. Reuben A. Carter to Alexander Macomb, October 19, 1824, "Plans for Removal," NA, RG 77; Edward Clark to John C. Calhoun, August 16, 1824, *ibid.*

29. "Survey of the Works at Fort Delaware, and Proceedings of a Court-Martial of Major Babcock," in ASP, Class V: *Military Affairs*, II, 792-822; Alexander Macomb to Samuel Babcock, November 16, 1824, U. S., Congress, Senate, *A Report of the Chief Engineer . . .*, S. Doc. No. 14, 19 Cong., 1 Sess., 1826, pp. 9-10.

30. Alexander Macomb to Samuel Babcock, March 5, 1825, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77.

31. U. S., Congress, Senate, *A Report to the Chief Engineer . . .*, S. Doc. No. 14, 19 Cong., 1 Sess., 1826, pp. 11-12.

32. *Ibid.* Alexander Macomb to Samuel Babcock, June 14, 1825, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77.

33. See the contract in Senate Document No. 14, 19 Cong., 1 Sess., 1826, pp. 7-8.

34. *Ibid.*, *passim*; Samuel Babcock, "Journal of A Tour of Duty Performed by the Orders of the War Department to Superintend and Inspect the Operations, in Clearing the River Ohio and Mississippi from the Obstructions called Planters, Sawyers, &c (June 30, 1825-April 15, 1826)," Court Martial Case Files, 1809-1894, Records of the Office of Judge Advocate General (Army), Record Group 153, National Archives (cited hereinafter as "Babcock Case," NA, RG 153).

35. Alexander Macomb to Samuel Babcock, October 27, 1825, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77; Senate Document No. 14, 19 Cong., 1 Sess., 1826, prints the complaints.

36. Senate Document No. 14, 19 Cong., 1 Sess., 1826, pp. 25-28.

37. *Ibid.*, pp. 15-17.

38. *Ibid.*, pp. 12-20; Alexander Macomb to Stephen H. Long, March 24, 1826, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77.

39. "Babcock Case," NA, RG 153.

40. *Ibid.*

41. Alexander Macomb to Samuel McKee, May 19, 1826, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77; Alexander Macomb to John Sowers, November 21, and December 10, 1826, *ibid.*; Alexander Macomb to Henry Shreve, December 1, 1826, *ibid.*

42. Alexander Macomb to Henry Shreve, December 1, 1826, *ibid.*; Alexander Macomb to Henry Shreve, April 9, 1827, *ibid.*; Alexander Macomb to John Bruce, April 9, 1827, *ibid.*

43. John Bruce to President Andrew Jackson, February 17, 1831, "Letters Received by the Topographical Bureau of the War Department, 1824-65," NA, RG 77; "Papers Relating to Bruce's Claims against the United States for damages sustained by his boats and other Equipment while working on the Ohio and Mississippi Rivers in 1824, 1825" (70 pages of

legal papers), Claude W. Unger Collection, Historical Society of Pennsylvania, Philadelphia, Pa.; U. S., Congress, Senate, *Report of the Committee of Claims, to Whom was Referred the Petition of John Bruce for Remuneration on Account of Losses on Contract for Removing Obstructions in the Ohio and Mississippi Rivers*, S. Doc. No. 421, 26 Cong., 1 Sess., 1840, *passim*; *Rivers and Harbors Laws*, I, 69.

44. U. S., Congress, House, *Navigation Ohio and Mississippi Rivers*, H. Rept. No. 379, 21 Cong., 1 Sess., 1830, p. 3.

45. *Rivers and Harbors Laws*, I, 40.

## CHAPTER IV: FOOTNOTES

1. A discussion of administrative aspects and operation of the Louisville and Portland Canal Company as a public corporation may be consulted in Paul B. Trescott, "The Louisville and Portland Canal Company, 1825-1874," *Mississippi Valley Historical Review*, XLIV (March, 1958), 686-708.

2. Some of the more interesting descriptions of the Falls in their natural state which might be consulted are accounts printed in Harlow Lindley, ed., *Indiana as Seen by Early Travelers*, pp. 30-31, 39-41. An interesting official Army report on the unimproved Falls is "Report on Site of National Armory on the Western Waters," April 24, 1823, in ASP, Class V: *Military Affairs*, II, 734-36.

3. John C. Oakes, "Works at the Falls of the Ohio River, Louisville, Ky.," *Military Engineer*, VI (September-October, 1914), 563-64. Robert R. Jones, long-time Assistant Engineer in Louisville and Cincinnati Engineer Districts, calculated the gradient at 25.25 feet in 1914, after completing a survey; present McAlpine Locks and Dam has a lift of 37 feet to submerge the Falls, provide a navigable depth up to Markland Locks and Dam, and permit the development of hydroelectric power.

4. See descriptions previously cited.

5. The work of Tarascon and Berthold is described in McMurtrie, *Sketches of Louisville and Its Environs*, pp. 160, 162-64; the work of the Falls pilots is mentioned in U. S., Congress, Senate, *Report: The Committee on 'Roads and Canals, to which was Referred the Bill to Authorize the Purchase of Stock for the United States in the Louisville and Portland Canal Company,'* S. Doc. No. 284, 26 Cong., 1 Sess., 1840.

6. Archer B. Hulbert, ed., *Ohio in the Time of the Confederation*, Vol. III of *Ohio Company Series* (Marietta, Ohio: Marietta Historical Commission, 1918), pp. 92-94; Gaillard Hunt, ed., *Journals of the Continental Congress, 1774-1789*, Vol. XXIV (Washington: Government Printing Office, 1922), p. 427.

7. Information about the early canal projects is provided by Paul Fatout, "Canal Agitation at Ohio Falls," *Indiana Magazine of History*, LVII (December, 1961), 279-309; and James Oliver Parker, "A History of the Canal Projects at the Falls of the Ohio River" (unpublished master's thesis, University of Kentucky, 1937). The formation of the Indiana Canal Company and the comments of General Wilkinson are reviewed in *Proceedings of the Managers of the Ohio Canal Company at Louisville on Wednesday, the 11th Day of September, 1805* (pamphlet; Lexington, 1805).

8. "Canal from the Head to the Foot of the Rapids of the Ohio River, communicated to the Senate, January 28, 1805," in ASP, Class X: *Miscellaneous*, I, 419; Thomas T. Davis to President Jefferson, March 17, 1805, in Clarence E. Carter, ed., *The Territorial Papers of the United States*, Vol. VII: *The Territory of Indiana, 1800-1810* (Washington, 1939), p. 272; Isaac J. Cox, "The Burr Conspiracy in Indiana," *Indiana Magazine of History*, XXV (December, 1929), 257-80.

9. *Proceedings of the Managers of the Ohio Canal Com-*

*pany at Louisville on Wednesday, the 11th Day of September, 1805, passim*; "Canal from the Head to the Foot of the Rapids of the Ohio River," communicated to the House, March 19, 1806, in ASP, Class X: *Miscellaneous*, I, 453-54; Alfred Pirtle, "Early History of the Louisville and Portland Canal" (unpublished 9 page manuscript, Kansas City Federal Record Center, Box NA1045, Folder L. & P. C. 67, NA, RG77), provides biographical information about Brooks. Brooks resigned from the Army in 1802 and moved to Louisville. He edited the *Louisville Gazette* from 1808 to 1810, surveyed and mapped Louisville in 1812, and died in 1816.

10. "Canal from the Head to the Foot of the Rapids of the Ohio River," communicated to the Senate, January 24, 1807, in ASP, Class X: *Miscellaneous*, I, 479; Albert Gallatin's report on "Roads and Canals," April 6, 1808, which includes a copy of the Brooks' map of the Falls, is printed in ASP, Class X: *Miscellaneous*, I, 724-921 (see especially pp. 821-26 and p. 732).

11. U. S., Congress, House, *Canal around the Falls in the Ohio River, Memorial of Citizens of Jeffersonville, Indiana*, H. Ex. Doc. No. 112, 29 Cong., 1 Sess., 1846, pp. 2-3; Charles K. Palmer, "Improvement of Navigation on the Ohio River" (65 page mimeographed study, historical files of Ohio River Division, Corps of Engineers, Cincinnati, Ohio), pp. 39-41; Logan Esarey, "Internal Improvements in Early Indiana," *Indiana Historical Society Publications*, V (1912), 65-69.

12. A general history of the Louisville and Portland Canal is Heber P. Walker, "Louisville and Portland Canal," *Indiana Magazine of History*, XXVIII (March, 1932), 21-30. "Report on Site of National Armory on the Western Waters," April 24, 1823, in ASP, Class V: *Military Affairs*, II, 736, provides information on the work of Baldwin; McMurtrie, *Sketches of Louisville and Its Environs*, pp. 177-78; *Louisville Public Advertiser*, August 4, 1818, quotes the Cincinnati *Western Spy* and prints a reply.

13. McMurtrie, *Sketches of Louisville and Its Environs*, pp. 172-77, 190.

14. "Reconnaissance of the Ohio River above the Falls Made in 1819 by Commissioners Appointed by the States of Virginia, Kentucky, Pennsylvania, and Ohio," November 2, 1819, n. p.; *Niles' Weekly Register*, XVII (December 25, 1819), 287; U. S., Congress, House, *Message from the President of the United States Transmitting a Report of the Board of Engineers on the Ohio and Mississippi Rivers Made in the Year 1821*, H. Ex. Doc. No. 35, 17 Cong., 2 Sess., 1823, pp. 8-10.

15. *Louisville Public Advertiser*, November 3, 1824; Paul B. Trescott, "The Louisville and Portland Canal Company, 1825-1874," *Mississippi Valley Historical Review*, XLIV (March, 1958), 687-89; Kentucky, General Assembly, "Governor's Message Endorsing Resolution of the Legislature of Ohio, on the Subject of a Canal Around the Falls of the Ohio River" (pamphlet, 1824; Filson Club collection), prints the report of Bates and Kelly.

16. *Louisville Public Advertiser*, October 22, 1825. A

biographical sketch of Judge Bates is printed in Charles B. Stuart, *Lives and Works of Civil and Military Engineers of America* (New York, 1871), pp. 91-108.

17. Louisville *Public Advertiser*, October 22, 1825. The best source for the construction history of the canal is Increase Allen Lapham Papers, Manuscript Division, Wisconsin State Historical Society, Madison, Wisconsin. Portions of these papers were printed in Samuel W. Thomas and Eugene H. Conner, eds., "The Falls of the Ohio River and Its Environs: The Journal of Increase Allen Lapham for 1827-1828," *Filson Club History Quarterly*, XLV (1971), 5, 199, 315, 381. Selections were also printed in Louisville *Courier-Journal*, October 30, 1898.

18. Louisville *Public Advertiser*, October 22, 1825, and December 23, 28, 1825. The July 10, August 2, and August 30 issues of *ibid.* provide progress reports.

19. See description of construction methods in Karl Bernhard, *Travels through North America During the Years 1825 and 1826* (2 vols.; Philadelphia, 1828), II, 130-31; Increase A. Lapham Papers, Wisconsin State Historical Society. For origin of "Hoosier," see William E. Wilson, *Indiana: A History* (Bloomington, 1966), p. 13; and Oscar D. Short, "Origin of the Term 'Hoosier,'" *Indiana Magazine of History*, XXV (June, 1929), 101-03.

20. Increase A. Lapham Papers, Wisconsin State Historical Society, provides details and sketches of the machinery.

21. Biographical sketch of White is printed in Charles B. Stuart, *Lives and Works of Civil and Military Engineers of America*, pp. 74-90. On the Louisville cement industry, see "Louisville and Portland Canal," *Family Magazine*, IV (1839), 294-96; Lewis Collins and Richard H. Collins, *History of Kentucky* (2 vols.; Louisville, 1924), II, 363.

22. Alfred Pirtle, "Early History of the Louisville and Portland Canal," pp. 5-6; Increase A. Lapham Papers, Wisconsin State Historical Society. Accounts of dimensions vary in different accounts, but Pirtle and Lapham were engineers and took measurements; hence, their accounts are presumed to be most reliable.

23. Trescott, "The Louisville and Portland Canal Company, 1825-1874," pp. 690-93; U. S., Congress, Senate, *Fifth Annual Report of the President and Directors of the Louisville and Portland Canal Company*, S. Doc. No. 36, 21 Cong., 1 Sess., 1830, pp. 4-5; Louisville *Public Advertiser*, January 17, 1831.

24. Louisville *Public Advertiser*, January 17 and 19, 1831, December 24 and 30, 1830; U. S., Congress, House, *Ohio River - Falls at Louisville*, H. Ex. Doc. No. 95, 32 Cong., 1 Sess., 1852, p. 7. An undated newspaper article, written by Hugh Hays, in Lewis Starling Collection, Manuscript Division, Kentucky Library, Bowling Green, Kentucky, states the opening of the canal was celebrated with "great rejoicing and a general jubilee," but no evidence was discovered to support this in other records. As reported by Captain Cram, the average prices for which work was completed were: rock excavation, \$1.50 per cubic yard; paving slopes, 15¢ per square yard; earth excavation, 15¢ per cubic yard; stone masonry, \$12.37 per perch.

25. Niles' *Weekly Register*, XLVI (March 31, 1832), 82.

26. Pirtle, "Early History of the Louisville and Portland Canal," pp. 6-7.

27. See statistics in Hunter, *Steamboats on Western Rivers*, pp. 183-85; and William E. Connelly and E. M. Coulter, *History of Kentucky* (5 vols.; New York, 1922), II, 726-27, which also quotes Governor Deshues of Kentucky.

28. Nashville *National Banner and Nashville Whig*, January 28, 1833; Pirtle, "Early History of the Louisville and Portland Canal," pp. 6-7.

29. Hunter, *Steamboats on Western Rivers*, p. 88; and note by Captain Frederick Way in *S&D Reflector*, IV (September, 1967), p. 23.

30. Trescott, "The Louisville and Portland Canal Company, 1825-1874," pp. 694-95. The complaints to Congress may be examined in Senate Document No. 5, 22 Cong., 2 Sess., 1832; Senate Document No. 6, 23 Cong., 1 Sess., 1833; and House Executive Document No. 11, 23 Cong., 1 Sess., 1833. There were others.

31. U. S., Congress, Senate, *Report: The Committee on Roads and Canals, to Which was Referred the Bill to Authorize the Purchase of Stock for the United States in the Louisville and Portland Canal Company*, S. Doc. No. 284, 26 Cong., 1 Sess., 1840, *passim*; U. S., Congress, House, *Louisville and Portland Canal*, H. Ex. Doc. No. 154, 28 Cong., 1 Sess., 1844, p. 8.

32. See Senate Document 284, 26 Cong., 1 Sess., 1840, cited above.

33. U. S., Congress, House, *Chute - Great Falls of Ohio*, H. Doc. No. 488, 23 Cong., 1 Sess., 1834, *Passim*.

34. U. S., Congress, House, *Site for an Armory - Louisville, Kentucky*, H. Doc. No. 46, 19 Cong., 1 Sess., 1826, *passim*; "Correspondence with Officers of the Louisville and Portland Canal Company relative to a Site for a National Armory," January 18, 1826, in ASP, Class V; *Military Affairs*, III, 188-93.

35. "General Report on an Examination and Survey of Various Sites for the Establishment of an Armory on the Western Waters," May 27, 1830, in ASP, Class V; *Military Affairs*, IV, 470-578. Captain Smith served in the Corps from 1820 to his death in 1858. He especially distinguished himself in action during the Mexican War. His assistant, Lieutenant George Whistler, was "Whistler's Father;" that is, he was the father of James Whistler, the artist. During this survey, Captain Smith sought to employ Increase Lapham as an assistant, but Lapham chose to remain at the Louisville canal. The report of 1842 on a site for the national armory is printed in U. S., Congress, House, *Site for a Western Armory*, H. Ex. Doc. No. 133, 27 Cong., 3 Sess., 1843. The armory was eventually constructed at Rock Island, Illinois, on the Upper Mississippi River.

36. Trescott, "The Louisville and Portland Canal Company, 1825-1874," pp. 697-700.

37. *Ibid.*; Heber P. Walker, "Louisville and Portland Canal," pp. 29-30.

38. Trescott, "The Louisville and Portland Canal Company, 1825-1874," pp. 697-700. Despite the numerous articles and papers written about the history of the Louisville and Portland Canal Company, a definite need for a comprehensive history of the canal still exists.

## CHAPTER V: FOOTNOTES

1. U. S., Congress, House, *Obstructions in the River Ohio*, H. Doc. No. 213, 20 Cong., 1 Sess., 1828, pp. 1-3.

2. *Rivers and Harbors Laws*, I, 40, 44, 51, 53, 57-59, 64, 67, 71, 75, 81-82, 86.

3. U. S., Congress, Senate, *Message from the President*

*of the United States to the Two Houses of Congress*, S. Doc. No. 1, 20 Cong., 1 Sess., 1827, p. 58; Charles Gratiot to Peter B. Porter, November 19, 1828, ASP, Class V; *Military Affairs*, IV, 12-17.

4. Remarks of Robert P. Henry to the House, December

28, 1826, in *Register of Debates in Congress*. 19th Congress, 2nd Session, p. 567. The Grand and Little Chains of Rocks in the Ohio River are not to be confused with obstructions with the same name in the Mississippi above Cairo, Illinois. The Little Chain was located in the river below Fort Massac opposite the present site of the village of Joppa, Illinois; the Grand Chain was just below the Little Chain, commencing at the present site of Baccus Landing (Mile 958) and obstructing the channel down to the present site of Lock and Dam No. 53 (Mile 962.6).

5. U. S., Congress, Senate, *Report of the Secretary of War Showing What Progress Has Been Made in Deepening and Clearing the Channel at a Place Called the Grand Chain*, S. Doc. 203, 20 Cong., 1 Sess., 1828, pp. 6-7.

6. *Ibid.*; U. S., Congress, House, *Obstructions - The Ohio River*, H. Rept. No. 269, 20 Cong., 1 Sess., 1828, *passim*; Alexander Macomb to William Courtney, May 14, 1827, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77; Alexander Macomb to Henry M. Shreve, May 14, 1827, *ibid.*; Charles Gratiot to Henry M. Shreve, April 9, 1829, *ibid.*

7. U. S., Congress, Senate, *Report of the Secretary of War Showing What Progress Has Been Made in Deepening and Clearing the Channel at a Place Called the Grand Chain*, S. Doc. No. 203, 20 Cong., 1 Sess., 1828, pp. 1-6; Dorsey, *Master of the Mississippi*, pp. 151-56; Secretary of War John W. Eaton report to the President, December 1, 1830, in ASP, Class V: *Military Affairs*, IV, 585-88.

8. Hunters, *Steamboats on Western Rivers*, pp. 195-96; John L. Smith to Henry M. Shreve, July 23, 1824, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77. Compare with account in Dorsey, *Master of the Mississippi*, pp. 142-43. Dorsey portrays Captain Shreve as a heroic figure fighting navigation monopolies, river obstructions, and an incompetent bureaucracy. She states that OCE did not reply to his suggestion for removing snags, but see the letter of Captain John L. Smith, OCE, cited above.

9. Dorsey, *Master of the Mississippi*, p. 156-61 (letter from Shreve to Chief Engineer Gratiot, October, 1829, quoted on p. 158).

10. U. S., Congress, House, *Letter from Henry M. Shreve to the Hon. C. A. Wickliffe upon the Subject of the Navigation of the Mississippi River*, H. Doc. No. 11, 20 Cong., 1 Sess., 1827, *passim*; U. S., Congress, House, *Obstructions in the River Ohio*, H. Doc. No. 213, 20 Cong., 1 Sess., 1828, *passim*.

11. Alexander Macomb to Henry M. Shreve, December 11, 1827, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77; Engineer Department to Henry M. Shreve, June 27, 1828, *ibid.* The contention of Dorsey, *Master of the Mississippi*, pp. 147-48, that OCE was dilatory in its actions on the subject of the steam snag-boat is not borne out by the records of the Engineer Department. Though the delay in authorizing and funding the construction of a prototype may have seemed excessive to the impatient Captain Shreve, the records of OCE indicate that the matter was handled expeditiously. And in view of the unfortunate results of the Bruce contract it is somewhat surprising that OCE approved the construction of the expensive snag-boat at such an early date.

12. *Louisville Public Advertiser*, May 9, 1829; U. S., Congress, House, *Navigation Ohio and Mississippi Rivers*, H. Rept. No. 379, 21 Cong., 1 Sess., 1830, pp. 3-4; U. S., Congress, House, *Henry M. Shreve-Snag Boat*, H. Rept. No. 272, 27 Cong., 2 Sess., 1843, pp. 9-12; Dorsey, *Master of the Mississippi*, pp. 148-54. Increase A. Lapham, Assistant Engineer at the Louisville and Portland Canal, visited the shipyard on June 4, 1829, saw the *Heliopolis*, and described it: "It consists of two boats about 100 feet long and 12 wide placed about 10 feet apart, and strongly connected

by timbers running across at the bow & stern — each boat contains a very powerful steam engine. The timbers at the bow are covered with sheat [*sic*] iron on the forward side which is to be applied to the log and the power of the engines is to remove it." Increase A. Lapham Papers, Wisconsin State Historical Society, Madison, Wisconsin.

13. Dorsey, *Master of the Mississippi*, pp. 145-55; Lieutenant Alexander Bowman report to General Charles Gratiot, January 31, 1835, ASP, Class V: *Military Affairs*, V, 691.

14. U. S., Congress, House, *Navigation Ohio and Mississippi Rivers*, H. Rept. No. 379, 21 Cong., 1 Sess., 1830, *passim*; Charles Gratiot to Charles A. Wickliffe, April 14, 1830, "Letters Sent by Office of Chief of Engineers Relating to Internal Improvements, 1824-30," NA, RG 77, is information furnished Congress by OCE in response to the memorial of Louisvillians, and it fully supports the construction of additional snag-boats. See summary of snag-boat construction by Colonel Stephen H. Long printed in U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, p. 208; *Rivers and Harbors Laws*, I, 82 (Congress appropriated \$23,000 on March 3, 1837, to replace the *Archimedes*).

15. U. S., Congress, House, *Ohio and Mississippi Rivers*, H. Ex. Doc. No. 66, 22 Cong., 2 Sess., 1833, *passim*; U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 2, 22 Cong., 1 Sess., 1831, pp. 90-93. Shreve's work on the Red River is covered in some detail in Dorsey, *Master of the Mississippi*, pp. 164-208.

16. Hunter, *Steamboats on Western Rivers*, pp. 198-99; Henry M. Shreve to Charles Gratiot, September 30, 1833, ASP, Class V: *Military Affairs*, V, 209-11; T. S. Brown to Charles Gratiot, May 8, 1833, *ibid.*, V, 214-17.

17. Hunter, *Steamboats on Western Rivers*, p. 193; Henry M. Shreve to Charles Gratiot, September 30, 1835, ASP, Class V: *Military Affairs*, V, 689; Henry M. Shreve to Charles Gratiot, September 30, 1832, *ibid.*, V, 59.

18. *Rivers and Harbors Laws*, I, 57-58. Act of March 2, 1831, provided for "removing the obstructions in the channel at the shoal places and ripples, and by such other means as may be deemed best for deepening of the channels of the Ohio River."

19. "Richard Delafield," *Professional Memoirs*, III (July-September, 1911), 416-18; Charles N. Branham, ed., *Register of Graduates and Former Cadets, United States Military Academy* (West Point, New York, 1960), pp. 174, 179 (cited hereinafter as *Register of Graduates, USMA*); Alexander H. Bowman, *Remarks on Making and Applying Concrete* (Washington, 1849).

20. Dorsey, *Master of the Mississippi*, p. 179; Henry M. Shreve to Charles Gratiot, September 30, 1832, ASP, Class V: *Military Affairs*, V, 58-60.

21. Henry M. Shreve to Charles Gratiot, September 30, 1832, ASP, Class V: *Military Affairs*, V, 58-60; Henry M. Shreve to Charles Gratiot, September 30, 1833, *ibid.*, V, 209-11; Alexander H. Bowman to Charles Gratiot, October 24, 1834, *ibid.*, V, 410-13. A related discussion is provided in Leland R. Johnson, "Army Engineers on the Cumberland and Tennessee, 1824-1854," *Tennessee Historical Quarterly*, XXXI (Summer, 1972), pp. 155-56. The author visited Cumberland Dam during the ground-breaking ceremonies for Smithland Locks and Dam, September 25, 1971.

22. S. Goodwin (by order of directors and president of Louisville and Portland Canal Company) to President Andrew Jackson, June 6, 1831, (G. 434 De Grange listing), NA, RG 77. An indorsement on the reverse of this letter states it was presented to Jackson on June 29, who stated the business had been attended to and Captain Shreve directed to divide his force and operate above and below the Falls.

This is confusing, for no orders for Shreve to do so have been located, and no operations above the Falls ensued, It is believed that the indorsement was in error; that Shreve was instructed *not* to divide his force. Shreve wrote in 1834: "In relation to the improvement of the bars on the Ohio river by wing dams, there can no longer be a doubt of the great benefits already produced by those built. And should that system of improvement be proceeded with by the government, there can be no doubt of obtaining four feet of water at its lowest stage from the Mississippi to the falls in the Ohio, and from Louisville to the mouth of the Ohio canal, at Portsmouth; and from then to Pittsburgh, three feet six inches may be obtained by the same system of improvement." Henry M. Shreve to Charles Gratiot, October 30, 1834, ASP, Class V: *Military Affairs*, V, 413-14.

23. *Rivers and Harbors Laws*, I, 71; George Dutton to Charles Gratiot, October 25, 1835, ASP, Class V: *Military Affairs*, V, 693-96; U. S., Congress, House, *Cumberland Road and Ohio River*, H. Ex. Doc. No. 52, 24 Cong., 2 Sess., 1836, pp. 38-41.

24. See note 23.

25. James St. Clair Morton, *Memoir of the Life and Services of Capt. and Brevet Major John Sanders* (Pittsburgh; W. S. Haven, 1861), pp. 43-60. This rare pamphlet was written by an Engineer officer who knew Sanders well. For some reason, Morton's biography of Sanders is sprinkled with attacks on the United States Military Academy; he claimed Sanders achievements as an engineer were accomplished in spite of his training at West Point. The biography is cited hereinafter as Morton, *Sanders*.

26. Morton, *Sanders*, pp. 9-13; John Sanders to Charles Gratiot, November 4, 1837, ASP, Class V: *Military Affairs*, VII, 690. W. Milnor Roberts began the survey of 1867 at the point where Sanders' survey had ended. Portions of the uppermost section of the river were resurveyed near the end of the nineteenth century for the slackwater project, but Sanders' survey was not completely superceded until the survey of 1911-14 was completed under the direction of General Lytle Brown and Robert R. Jones, Assistant Engineer.

27. U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 2, 25 Cong., 3 Sess., 1838, pp. 317-38; Morton, *Sanders*, pp. 9-10.

28. U. S. Congress, Senate, *Report on the Improvements of the Falls of the Ohio River*, S. Doc. No. 530, 26 Cong., 1 Sess., 1840, *passim*.

29. Morton, *Sanders*, pp. 16-17; U. S., Congress, Senate, *Message from the President of the United States to the Two*

*Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, p. 215.

30. John Sanders to Charles Gratiot, November 4, 1837, ASP, Class V: *Military Affairs*, VII, 689-92; *Rivers and Harbors Laws*, I, 57-58, 71, 75, 81, 86.

31. Andrew Jackson to Amos Kendall, July 23, 1832, in John S. Bassett, ed., *Correspondence of Andrew Jackson* (7 vols.; Washington, 1926-35), IV, 465; Andrew Jackson to Martin Van Buren, October 18, 1830, in *ibid.*, pp. 185-86; Carlton Jackson, "The Internal Improvement Vetoes of Andrew Jackson," *Tennessee Historical Quarterly*, XXV (Fall, 1966), 277; Edward L. Pross, "A History of Rivers and Harbors Appropriation Bills, 1866-1933" (unpublished Ph.D. dissertation, Ohio State University, 1938), p. 23. An editorial on Jackson's position is printed in *Louisville Public Advertiser*, January 13, 1831. Jackson's opinion of the Corps of Engineers is revealed in Andrew Jackson to John C. Calhoun, August 9, 1920, in W. Edwin Hemphill, ed., *The Papers of John C. Calhoun*, V (Columbia, S. C., 1971), 317-19.

32. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 25 Cong., 3 Sess., 1839, I, 107 (see also Sen. Doc. No. 58, 26 Cong., 1 Sess., 1840, pp. 10-12). For further information about Van Buren's policies, see Joseph H. Harrison, Jr., "Martin Van Buren and His Southern Supporters," *Journal of Southern History*, XXII (November, 1956), 438-58.

33. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 26 Cong., 1 Sess., 1839, pp. 193-96 (see also Senate Doc. No. 1, 26 Cong., 2 Sess., 1840, p. 120).

34. Douglas S. Freeman, *R. E. Lee: A Biography* (4 vols.; New York, 1934-35), I, 140; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 26 Cong., 2 Sess., 1840, pp. 122-26.

35. Dorsey, *Master of the Mississippi*, pp. 206-07; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 26 Cong., Sess. 1840, pp. 120-22.

36. U. S., Congress, House, *Henry M. Shreve - Snag-Boat*, H. Rept. No. 272, 27 Cong., 3 Sess., 1843 *passim*; U. S., Congress, House, Committee on Patents, *Henry M. Shreve*, H. Rept. No. 369, 29 Cong., 1 Sess., 1846, *passim*; *Rivers and Harbors Laws*, I, 332.

37. Dorsey, *Master of the Mississippi*, pp. 206-20, 248, 260.

## CHAPTER VI: FOOTNOTES

1. Pross, "A History of Rivers Appropriation Bills, 1866-1933," pp. 25-41; Albjerg, "Internal Improvements without a Policy," pp. 176-77.

2. U. S., Congress, House, *Memorial of Citizens of the City of Cincinnati, Relative to the Improvement of the Navigation of the Ohio and Mississippi Rivers*, H. Doc. No. 126, 27 Cong., 3 Sess., 1843, *passim*.

3. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 27 Cong., 3 Sess., 1842, I, 10; *Rivers and Harbors Laws*, I, 96, 98, 100.

4. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, pp. 208-09; *Louisville Journal*, December 14, 1841.

5. Ella H. Ellwanger, "Famous Steamboats and Their

Captains on Western and Southern Waters," *Register of Kentucky State Historical Society*, XVIII (January, 1920), 21-29.

6. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 27 Cong., 3 Sess., 1842, pp. 285-86; John W. Russell to Topographical Bureau, March 31, April 15, June 4, August 30, September 19, October 10, November 27, December 30, 1842, and February 2, April 26, July 10, 1843, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77.

7. U. S., Congress, House, *Survey of the Ohio River*, H. Doc. No. 50, 27 Cong., 3 Sess., 1843, *passim*; George W. Hughes to Topographical Bureau, October 10, 12, 16, 24, 27, 1842, January 5, February 13, 1843, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77.

8. Wood, *Long*, pp. 189-206; Stephen H. Long to Topo-

graphical Bureau, March 2, April 26, April 27, May 10, 15, 19, June 1, 1843, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; Stephen H. Long to J. J. Abert, April 26, 1843, in "Letters and Reports Sent by the Office of Improvements on the Western Rivers," NA, RG 77.

9. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, pp. 213-14; *ibid.*, 28 Cong., 2 Sess., 1844, pp. 274-79.

10. Stephen H. Long to J. J. Abert, December 20, 1853, in "Letters and Reports Sent by the Office of Improvements on the Western Rivers," NA, RG 77.

11. Stephen H. Long to J. J. Abert, April 14 and 24, 1848, in "Letters and Reports Sent by the Office of Improvements on the Western Rivers," NA, RG 77; U. S., Congress, House, *Message from the President to the Two Houses of Congress*, H. Ex. Doc. No. 2, 29 Cong., 1 Sess., 1845, pp. 348-49.

12. Campbell Graham to Topographical Bureau, December 7, 1842, March 21, 28, 1843, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; Morton, *Sanders*, pp. 17-18; J. J. Abert to Joseph Totten, March 2, 1843, in "Register of Letters Received by Office of Ohio River Improvement, 1835-1845," NA, RG 77.

13. U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, pp. 182-83.

14. Stephen H. Long to Topographical Bureau, April 25, 29, May 11, 1844, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; *Haldeman's Directory for Louisville for 1844-1845*, p. 293.

15. John Sanders to Topographical Bureau, July 16, 1844, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, p. 220; *ibid.*, 28 Cong., 2 Sess., 1844, pp. 270-71.

16. Hunter, *Steamboats on Western Rivers*, p. 204; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, pp. 216-20.

17. See citations in note 16 and Morton, *Sanders*, pp. 13-14.

18. Albjerg, "Internal Improvements without a Policy," p. 176; Gould, *Fifty Years on the Mississippi*, p. 290; Eugene I. McCormac, *James K. Polk: A Political Biography* (2nd ed.; New York, 1965), pp. 678-80; *Cincinnati Gazette*, October 2, 1846, as quoted in Hunter, *Steamboats on Western Rivers*, p. 191.

19. James W. Abert to James Taylor, June 2, 1852, in James Taylor Papers, Filson Club, Louisville, Kentucky; U. S., Congress, House, *Message from the President to the Two Houses of Congress*, H. Ex. Doc. No. 2, 29 Cong., 1 Sess., 1845, p. 298. See similar comments by Abert in U. S., Congress, House, *Mississippi River and Tributaries*, H. Doc. No. 153, 28 Cong., 1 Sess., 1844, p. 2.

20. U. S., Congress, House, *Message from the President to the Two Houses of Congress*, H. Ex. Doc. No. 2, 29 Cong., 1 Sess., 1845, pp. 348-58; Stephen H. Long to J. J. Abert, May 26, 1846, "Letters and Reports Sent by the Office of Improvements on the Western Rivers," NA, RG 77. Allan Campbell completed the first railroad in South America, was again employed by the Engineers on New York harbor defenses during the Civil War, became chief of construction on the Union Pacific Railroad, and at the end of his career served as Commissioner of Public Works and Comptroller for New York City. See obit. in *Engineering News*, XXXI (March 22, 1894), 237.

21. Morton, *Sanders*, pp. 18-27; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Doc. No. 1, 28 Cong., 1 Sess., 1843, p. 223.

22. Morton, *Sanders*, pp. 28-29.

23. Hunter, *Steamboats on Western Rivers*, p. 553; for a listing of steamboats employed by the Army during the Mexican War, see U. S., Congress, Senate, *Report of the Secretary of War Showing the Contracts Made Under the Authority of that Department during the Year 1848*, S. Ex. doc. No. 17, 30 Cong., 2 Sess., 1849, pp. 23-96. Stephen H. Long to Topographical Bureau, August 8, October 12, 1846, in "Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 8, 30 Cong., 1 Sess., 1848, pp. 670-78; informational note in *S&D Reflector*, IV (December, 1966), 22-23; Wood, *Long*, pp. 211-17.

24. U. S., Congress, House, *Message from the President to the Two Houses of Congress*, H. Ex. Doc. No. 1, 30 Cong., 2 Sess., 1848, p. 324.

25. *Ibid.*, H. Ex. Doc. No. 5, 31 Cong., 1 Sess., 1849, pp. 335-43; U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Ex. Doc. No. 1, 32 Cong., 1 Sess., 1851, p. 428, quotes Colonel Long: "The important works under this head have languished another year, for want of appropriations."

26. Stephen H. Long to James W. Abert, March 7, 1847, in "Letters and Reports Sent by the Office of Improvements of the Western Rivers," NA, RG 77; James W. Abert to Stephen H. Long, March 7, 1847, in *ibid.*; Stephen H. Long to J. J. Abert, March 7, 1847, in *ibid.* James W. Abert ranked 55th in the class of 1842 at the Military Academy; he married the daughter of Colonel James Taylor of Louisville. See *Register of Graduates, USMA*, p. 193, and the Abert Correspondence with James Taylor in James Taylor Papers, Filson Club, Louisville, Kentucky.

27. Wood, *Long*, pp. 219-32; Hunter, *Steamboats on Western Rivers*, pp. 462-64; Richard G. Wood, "Construction of the Louisville and Paducah Marine Hospitals," *Register of Kentucky Historical Society*, LVI (January, 1959), 27-32; *ibid.*, "The Marine Hospital at Napoleon," *Arkansas Historical Quarterly*, XIV (Spring, 1955), 38-42.

28. U. S., Congress, House, *Memorial from a Meeting of Citizens of the West, Held at Evansville, Indiana, on the Subject of Western Interests*, H. Misc. Doc. No. 3, 31 Cong., 2 Sess., 1850, *passim*; U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Ex. Doc. No. 1, 32 Cong., 1 Sess., 1851, p. 18.

29. *Rivers and Harbors Laws*, I, 119-24; see lengthy debate over constitutional issues in *Congressional Globe*, 32 Cong., 1 Sess., XXV, 827-32, 863-75. U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Doc. No. 1, 33 Cong., 1 Sess., 1853, pp. 29-53, 80-83, 86-92.

30. Pross, "A History of Rivers and Harbors Appropriation Bills, 1866-1933," pp. 36-39; *Rivers and Harbors Laws*, I, 131-36; Roy Nichols, *Franklin Pierce: Young Hickory of the Granite Hills* (Philadelphia, 1958), 354-55, 374-75; U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Doc. No. 1, 33 Cong., 1 Sess., 1853, pp. 25-29.

31. John W. Russell to General Armstrong, February 3, 1853, in "Letters Received by the Topographical Bureau, 1824-65," NA, RG 77; Wood, *Long*, pp. 236-40; Jefferson Davis to Stephen H. Long, September 14, 1853, in "Letters and Reports Sent by the Office of Improvements of the Western Rivers," NA, RG 77; Stephen H. Long to Jefferson Davis, September 20, 1853, *ibid.*; Jefferson Davis to Stephen H. Long, September 29, 1853, *ibid.*; Stephen H. Long to Topographical Bureau, November 1, December 20, 1853, in "Register of Letters received by Topographical Bureau, 1824-66," NA, RG 77.

32. Stuart, *Lives and Works of Civil and Military Engineers of America*, pp. 257-85, provides a biography of Ellet; Charles Ellet, Jr., to Topographical Bureau, June 15, 1849, in

"Registers of Letters Received by Topographical Bureau, 1824-66," NA, RG 77; U. S., Congress, Senate, *Report of the Select Committee on the Memorial of Charles Ellet, Jr.*, S. Doc. No. 191, 31 Cong., 1 Sess., 1850, *passim*.

33. U. S., Congress, Senate, *Improvement of Ohio River*, S. Rept. No. 319, 34 Cong., 3 Sess., 1857, p. 6; Ellwood Morris, *Treatise on the Improvement of the Ohio River* (Pottsville, Pa., 1857), *passim*; Thomas P. Roberts, "Floods and Means of Their Prevention in our Western Rivers," *Proceedings of Engineers' Society of Western Pennsylvania*, XXIII (July, 1907), 315. Charles Ellet explained his theories in two pamphlets: *The Mississippi and Ohio Rivers* (Philadelphia, 1853); and *Report on the Improvement of the Kanawha and Incidentally of the Ohio River, by Means of Artificial Lakes* (Philadelphia, 1858).

34. Biographies and discussions of W. Milnor Roberts' work may be located in "William Milnor Roberts, Civil Engineer," *Engineering News*, V (January 11, 1879), 9-10; John Bogart, "William Milnor Roberts, Past-President, ASCE," *Transactions of the American Society of Civil Engineers*, XXXVI (December, 1896), 531-37; Robert R. Jones, "The Ohio River: A brief account of the considerations which led to the present project for its Canalization" (unpublished 30 page manuscript, Cincinnati, March 27, 1922, in Kansas City Federal Records Center, Box NA1141, Folder Ohio 450, NA, RG 77).

35. Pittsburgh Board of Trade, *Letters to the Pittsburgh Board of Trade on the improvement of the Ohio River by Josiah Copley* (pamphlet; Pittsburgh, 1856), *passim*; Jones, "The Ohio River: A brief account . . .," pp. 12-13; U. S., Congress, Senate, *Improvement of Ohio River*, S. Rept. No. 319, 34 Cong., 3 Sess., 1857, p. 5.

36. Herman Haupt, *A Consideration of the Plans Proposed for the Improvement of the Ohio River* (pamphlet; Philadelphia, 1855), *passim*; U. S., Congress, Senate, *Improvement of Ohio River*, S. Rept. No. 319, 34 Cong., 3 Sess., 1857, p. 9.

37. U. S., Congress, House, *Falls of the Ohio*, H. Rept. No. 661, 29 Cong., 1 Sess., 1846, pp. 1-2.

38. U. S., Congress, House, *Ohio River-Falls at Louisville*, H. Ex. Doc. No. 95, 32 Cong., 1 Sess., 1852, *passim*; *ibid.*, Senate, *Report of Captain T. J. Cram on the Best Mode of Improving the Navigation of the Ohio at the Falls at Louisville*, s. Doc. No. 243, 28 Cong., 1 Sess., 1844, *passim*; U. S., Congress, House, *Falls of the Ohio*, H. Rept. No. 661, 29 Cong., 1 Sess., 1846, pp. 1-16; Haldeman's *Picture of Louisville, Directory and Business Advertiser, for 1844-1845* (Louisville, 1844), p. 63. Lieutenant James W. Abert wrote James Taylor, February 18, 1852, that a dam below the Falls would need a crest 37 feet above the mitre sill of the Canal and would forever ruin natural navigation; in James Taylor

Papers, Filson Club, Louisville, Kentucky.

39. Salmon P. Chase, *Improvement of Navigation of the Falls of the Ohio: May 1851* (pamphlet; Cincinnati, 1851), *passim*; *Rivers and Harbors Laws*, I, 123; Stephen H. Long to J. J. Abert, February 14, 1853, incloses "Proceedings of a Board of Topo. Engineers Convened at Louisville, Ky in 1852 to consider imp. Falls Ohio," in "Letters Received by Topographical Bureau, 1824-1865," NA, RG 77 (official report of Board later printed as S. Doc. No. 42, 32 Cong., 2 Sess.).

40. Long proposed the construction of a single lock, 360 by 75 feet, with a 25-foot lift, and widening the canal to 100 feet. The engineers later employed by the company adopted a two-flight, rather than single, lock. See full report of Long in U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Ex. Doc. No. 11, 35 Cong., 1 Sess., 1858, pp. 315-19. Trescott, "The Louisville and Portland Canal Company, 1825-1874," pp. 702-04. Actual construction of the enlarged canal is reviewed in Chapter VIII, *infra*.

41. U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Ex. Doc. No. 11, 35 Cong., 1 Sess., 1858, pp. 283, 297. Discussions of snag removal, commercial developments on the waterways, and accident statistics are provided in Albert E. Cowdrey, *The Delta Engineers: A History of the U. S. Army Corps of Engineers in the New Orleans District* (New Orleans, 1971), pp. 11-12; U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 1, 34 Cong., 1 Sess., 1856, pp. 353-65; Ambler, *Transportation in Ohio Valley*, pp. 185-207; Isaac Lippincott, *A History of Manufactures in the Ohio Valley to the Year 1860* (New York, 1914), p. 642.

42. U. S., Congress, Senate, *Message from the President of the United States to the Two Houses of Congress*, S. Ex. Doc. No. 11, 35 Cong., 1 Sess., 1858, p. 1046.

43. *Ibid.*, pp. 303-04, 314-15; *ibid.*, S. Ex. Doc. No. 1, 35 Cong., 2 Sess., 1858, p. 1046.

44. Samuel Cooper to James W. Abert, May 15, 1858, in "Letters and Reports Sent by the Office of Improvement of the Western Rivers," NA, RG 77; James W. Abert to J. J. Abert, June 1, 1858, and September, 1859, *ibid.*

45. Secretary of War to J. J. Abert, October 21, 1859, *ibid.*; J. J. Abert to Secretary of War, October 24, 1859, *ibid.*; J. J. Abert to James W. Abert, January 17, 1860, *ibid.*; Samuel Cooper to James W. Abert, March 8, 1860, *ibid.* James W. Abert retired in 1864 and died at Louisville in 1879. It is suspected that he was a confidential observer of the activities of the canal company on behalf of the principal stockholder, the United States, during his service at Louisville in 1858-59.

## CHAPTER VII: FOOTNOTES

1. William C. Eidson, "Louisville, Kentucky, During the First Year of the Civil War," *Filson Club History Quarterly*, XXXVIII (1964), 224-38; Carl Vitz, "Cincinnati: Civil War Port," *Museum Echoes*, XXXIV (July, 1961), 51-54.

2. Ambler, *Transportation in Ohio Valley*, pp. 237-46.

3. U. S., Congress, Senate, *Message from the President to the Two Houses of Congress*, S. Ex. Doc. No. 1, 37 Cong., 2 Sess., 1861, pp. 508-10.

4. U. S., War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (70 vols. in 128, Washington, 1880-1901), Ser. I, LII, Pt. 1, p. 164. (This collection cited hereinafter as O.R., always Series I unless otherwise indicated.) For a list of steamboats purchased or hired by the United States and

those sunk in action consult U. S., Congress, House, *Vessels Bought, Sold, and Chartered by the United States*, H. Ex. Doc. No. 337, 40 Cong., 2 Sess., 1868.

5. The official account of the incident at Paducah is printed in O.R., IV, 176-78. A discussion of the incident and the imposition of a property tax on the citizens of Paducah after the war to reimburse the owners of the *Sam Orr* is provided in Fred Way, "How Come?" *S&D Reflector*, VIII (March, 1971), 28-30.

6. Ambler, *Transportation in Ohio Valley*, pp. 248-56; Hunter, *Steamboats on Western Rivers*, pp. 547-51.

7. Ambler, *Transportation in Ohio Valley*, pp. 259-62; Daniel W. Snepp, "Evansville's Channels of Trade and the Secession Movement, 1850-1865," *Indiana Historical So-*

cety Publications, VIII (1928), 334-40; William E. Connelley and E. M. Coulter, *History of Kentucky* (5 vols.; New York, 1922), II, 882-83.

8. Connelley and Coulter, *History of Kentucky*, II, 880.

9. Helen B. Crocker, "Green River Steamboating: A Cultural History, 1828-1931" (unpublished master's thesis, Western Kentucky University, 1970), p. 65; *Louisville Journal*, September 11, 30, October 1, 2, 3, 8, 17, 1861. Congressman William H. Wadsworth is quoted in the October 3 issue.

10. Milford M. Miller, "Evansville Steamboats During the Civil War," *Indiana Magazine of History*, XXXVII (December, 1941), 369; Edward M. Coffman, "Captain Thomas Henry Hines and His February, 1863, Raid," *Register of Kentucky State Historical Society*, LV (April, 1957), 105-08; John W. Coleman, *Steamboats on the Kentucky River* (pamphlet; Lexington, 1960), pp. 29-31.

11. Sketches of Engineer activities during the Civil War are Philip M. Thienel, "Engineers in the Union Army, 1861-1865," *Military Engineer*, XLVII (January-February, March-April, 1955), 36-41, 110-15; William M. Robinson, Jr., "The Confederate Engineers," *Military Engineer*, XXII (July-August, September-October, November-December, 1930), 297-305, 410-19, 512-17; James L. Nichols, *Confederate Engineers* (Tuscaloosa, Ala., 1957), *Confederate Centennial Studies*, No. 5; George T. Ness, Jr., "Army Engineers of the Civil War," *Military Engineer*, LVII (January-February, 1965), 38-40.

12. Philip M. Thienel, "The Longest Floating Bridge," *Military Engineer*, XLIX (March-April, 1957), 120-21; *Harper's Weekly*, October 26, 1861; *Louisville Journal*, September 26, 1861.

13. Thienel, "The Longest Floating Bridge," pp. 120-21.

14. William E. Merrill, "The Engineer Service in the Army of the Cumberland," in Thomas B. Van Horne, *History of the Army of the Cumberland: Its Organizations, Campaigns, and Battles*, Vol. II (Cincinnati, 1875), 439-54.

15. James H. Simpson to Richard Delafield, November 15, 1864, in O.R., XXXIX, Pt. 3, 775-76; James H. Simpson to Richard Delafield, June 24, 1865, in Engineer Department, "Letters Received, 1865 (No. S9581)," NA, RG 77.

16. C. F. Smith to Adj. General, November 6, 1861, in O.R., IV, 339-40.

17. A history of the defense of Louisville in 1862 is Charles K. Messmer, "Louisville and the Confederate Invasion of 1862," *Register of Kentucky State Historical Society*, LV (October, 1957), 299-306. General P. G. T. Beauregard is quoted as advocating destruction of the canal in *ibid.*

18. *Ibid.*

19. A complete history of fortification construction under his direction was written by Colonel Simpson in his letter to General Delafield, June 24, 1865, in Engineer Department, "Letters Received, 1865 (S.9581)," NA, RG 77.

20. *Ibid.* Fortifications were named for Union officers killed in action. General James St. Clair Morton and General James B. McPherson, as examples, were Union Engineer officers who died before Petersburg and Atlanta in 1864.

21. *Ibid.*

22. *Ibid.* Details of the program to construct blockhouses for railroad bridge defense are provided in Leland R. Johnson, "Civil War Railroad Defenses," *Tennessee Valley Historical Review*, II (Summer, 1972), 20-26.

23. U. S., War Department, *Report of the Secretary of War, with Accompanying Papers* (Washington, 1866), pp. 102-03; Russell F. Weigley, *Quartermaster General of the Union Army: A Biography of M. C. Meigs* (New York, 1959), pp. 330-33, 346; George B. Nicholson, "John Roberts Gilliss, M. ASCE," *Transactions of American Society of Civil Engineers*, XXXVI (December, 1896), 555-56; Samuel

Whinery, "George Benson Nicholson, M. ASCE," *Transactions of American Society of Civil Engineers*, LIX (December, 1907), 556-61.

24. U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 1, 39 Cong., 1 Sess., 1865, I, 212-16.

25. *Ibid.*, p. 225; James P. Jones, "Farewell to Arms: Union Troops Muster Out at Louisville, June-August, 1865," *Filson Club History Quarterly*, XXXVI (1962), 272-82.

26. U. S., War Department, *Report of the Secretary of War, with Accompanying Papers* [for 1866], p. 112; Hunter, *Steamboats on Western Rivers*, p. 559; U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 1, 39 Cong., 1 Sess., 1865, I, 215-16.

27. Carlton Jackson, *Presidential Vetoes, 1792-1945* (Athens, Ga., 1967), pp. 148, 162-64; Pross, "A History of Rivers and Harbors Appropriation Bills, 1866-1933," pp. 43-89; L. Y. Schermerhorn, "The Rise and Progress of River and Harbor Improvements in the U. S.," *Engineering News*, XXXIII (May 30, 1895), 359-60.

28. *Rivers and Harbors Laws*, I, 151-56; U. S., Congress, House, *Report of Chief Engineer for 1866*, H. Ex. Doc. No. 18, 39 Cong., 2 Sess., 1866, p. 4.

29. U. S., War Department, Corps of Engineers, *Annual Report of the Chief of Engineers for 1867* (Washington, 1868), pp. 376-78. Prior to 1867 the annual report of the Chief of Engineers, the most important source for the history of the Corps of Engineers, was printed in various government documents, usually accompanying the President's annual message to Congress. Beginning in 1867 the *Annual Report of the Chief of Engineers* was separately printed and bound and the series has since continued. Published at the end of each fiscal year (currently there is a time lag of 18 to 24 months), the title and format of the series has varied slightly from time to time, but it is commonly known as the *Annual Report of the Chief of Engineers*. Hereinafter it will be cited as ARCE followed by the fiscal year upon which the report was made. The use of *ibidem* is a source of confusion when citing this series and will be dispensed with in this case, and, though the annual report is multivolume, the pages are numbered consecutively in each report until 1953; therefore, volume numbers will not be given until reports subsequent to 1953 are cited.

30. ARCE, 1867, pp. 376-95.

31. ARCE, 1868, pp. 590-91; *Louisville Daily Journal*, May 22, 1867; ARCE, 1869, pp. 291-94.

32. ARCE, 1868, pp. 591-92.

33. ARCE, 1870, pp. 65-66; ARCE, 1871, p. 307.

34. Richard Delafield to E. M. Stanton, August 2, 1866, in Engineer Department, "Letters Sent, 1866 (SW100)," NA, RG 77; W. M. Roberts to Chief of Engineers, August 16, 1866, in Engineer Department, "Registers of Letters Received, 1866-70," *ibid.* Biographical sketches of W. Milnor Roberts may be located in *Engineering News*, V (January 11, 1879), 9-10; and John Bogart, "William Milnor Roberts, Past-President, ASCE," *Transactions of American Society of Civil Engineers*, XXXVI (December, 1896), 531-37.

35. U. S., Congress, House, *River and Harbor Improvements*, H. Ex. Doc. No. 56, 39 Cong., 2 Sess., 1867, pp. 243-44, 261.

36. *Ibid.*, pp. 322-23.

37. ARCE, 1867, pp. 401-02.

38. Ambler, *Transportation in Ohio Valley*, pp. 295-303; Hunter, *Steamboats on Western Rivers*, pp. 569-70; Pittsburgh Board of Trade, *Letters to the Pittsburgh Board of Trade on the Improvement of the Ohio River by Josiah Copley*, pp. 11-12; ARCE, 1871, p. 449.

39. Ambler, *Transportation in Ohio Valley*, pp. 303-06;

Hunter, *Steamboats on Western River*, pp. 569-70; ARCE, 1871, pp. 398-400; U. S., Congress, House, *River and Harbor Improvements*, H. Ex. Doc. No. 56, 39 Cong., 2 Sess., 1867, pp. 262-63; Arthur E. Hopkins, "Steamboats at

Louisville and on the Ohio and Mississippi Rivers," *Filson Club History Quarterly*, XVII (July, 1943), 160-61; James Parton, "Pittsburgh," *Atlantic Monthly*, XXI (January, 1868), 25.

## CHAPTER VIII: FOOTNOTES

1. ARCE, 1869, pp. 277-79; ARCE, 1872, p. 459; Louisville *Courier-Journal*, February 29, 1872.

2. ARCE, 1878, pp. 776-79; Louisville *Courier-Journal*, February 29, 1872.

3. Connelley and Coulter, *History of Kentucky*, II, 945-46; Ozro J. Dodds, *Louisville and Portland Canal: Speech of Hon. Ozro J. Dodds of Ohio, in the House of Representatives, February 22, 1873* (Pamphlet; Washington, 1873), p. 14.

4. U. S., Congress, House, *River and Harbor Improvements*, H. Ex. Doc. No. 56, 39 Cong., 2 Sess., 1869, pp. 317-18.

5. *Rivers and Harbors Laws*, I, 167; ARCE, 1867, pp. 38-39.

6. James H. England, "Godfrey Weitzel," *Professional Memoirs*, X (September-October, 1918), 747-50.

7. ARCE, 1868, pp. 528-555.

8. ARCE, 1868, p. 538; see also general comments on improvement of Ohio River on p. 533.

9. ARCE, 1868, p. 538; ARCE, 1873, pp. 529-30; U. S., Congress, House, *Ship Canal around the Falls of the Ohio River*, H. Ex. Doc. No. 181, 40 Cong., 2 Sess., 1868, *passim*.

10. *Rivers and Harbors Laws*, I, 174; Cincinnati Board of Trade, *Report of the Committee on River Navigation of the Board of Trade of Cincinnati, on the Enlargement of the Louisville Canal and the Bridging of the Ohio River* (pamphlet; Cincinnati, 1870), *passim*; Louisville *Courier-Journal*, February 29, 1872. See also General Weitzel's reports in ARCE for fiscal years 1869-1872.

11. ARCE, 1871, p. 461; ARCE, 1872, pp. 442-46, 452-59. One of the works acquired and translated from German by General Weitzel was printed by OCE: Godfrey Weitzel, *Lock-Gates. Translation of [Hanckes'] Notes Accompanying Drawings Concerning Construction of Iron Lock-Gates for Harbors of Weser River, Germany* (pamphlet; Washington, 1873).

12. ARCE, 1872, pp. 458-59; Louisville *Courier-Journal*, February 27 and 29, 1872.

13. *Rivers and Harbors Laws*, I, 204-05; ARCE, 1873, pp. 536-37. Toll receipts at the Louisville canal, 1831 to 1872, were:

1831	\$ 12,750.77	1852	\$153,758.12
1832	25,706.12	1853	178,869.39
1833	60,736.92	1854	149,640.43
1834	61,848.17	1855	94,356.19
1835	80,165.24	1856	75,791.85
1836	88,343.23	1857	110,015.38
1837	145,424.69	1858	75,459.21
1838	121,107.16	1859	90,905.63
1839	180,364.01	1860	131,917.15
1840	134,904.55	1861	42,650.02
1841	113,944.59	1862	69,936.90
1842	95,005.10	1863	152,937.02
1843	107,274.65	1864	164,476.26
1844	140,389.97	1865	175,515.49
1845	138,291.17	1866	180,925.40
1846	149,401.84	1867	114,961.35
1847	139,900.72	1868	155,495.88
1848	158,067.96	1869	167,171.60
1849	129,953.46	1870	139,175.00
1850	115,707.88	1871	159,838.90
1851	167,066.49	1872	207,025.19

14. ARCE, 1872, pp. 444-52.

15. U. S., Congress, Senate, *Report of the Select Committee on Transportation-Routes to the Seaboard*, S. Rept. No. 307, 43 Cong., 1 Sess., 1874, p. 544; Louisville *Courier-Journal*, July 13, 1872.

16. ARCE, 1873, pp. 530-35; *Rivers and Harbors Laws*, I, 215, 222-24; ARCE, 1875, p. 778.

17. ARCE, 1878, p. 781; U. S., Congress, House, Committee on Railways and Canals, *Tolls on the Louisville and Portland Canal*, H. Rept., No. 348, 46 Cong., 2 Sess., 1880, *passim*.

18. *Rivers and Harbors Laws*, I, 306; Louisville *Courier-Journal*, July 3, 1880.

19. Godfrey Weitzel to S. F. Covington, January 7, 1881, in General Godfrey Weitzel Letterbooks, Manuscript Division, Cincinnati Historical Society, Cincinnati, Ohio; *Rivers and Harbors Laws*, I, 346-47.

20. ARCE, 1874, pp. 566-69; ARCE, 1873, p. 538; ARCE, 1875, pp. 776-82; ARCE, 1878, p. 783.

21. ARCE, 1868, pp. 534-35; ARCE, 1869, pp. 273-77; ARCE, 1870, pp. 63-64, 385; ARCE, 1876, pp. 747-78.

22. Charles K. Palmer, *Improvement of Navigation on the Ohio River* (pamphlet; Cincinnati, 1938), pp. 52-53; ARCE, 1882, pp. 1877-79; John C. Oakes, "Works at the Falls of the Ohio River, Louisville, Ky." *Military Engineer*, VI (September-October, 1914), 572.

23. Godfrey Weitzel to Major George W. Davis, July 14, 1879, in Weitzel Letterbook, Manuscript Division, Cincinnati Historical Society.

24. ARCE, 1876, pp. 751-63; ARCE, 1877, pp. 640-41.

25. ARCE, 1875, pp. 772-76; ARCE, 1878, p. 788.

26. ARCE, 1876, pp. 751-52; ARCE, 1875, p. 782; ARCE, 1880, p. 1725.

27. ARCE, 1880, p. 1725; John C. Oakes, "Works at the Falls of the Ohio River, Louisville, Ky.," *Military Engineer*, VI (September-October, 1914), 570; Harry Burgess to C. W. Holbrook, September 18, 1905, in Kansas City Federal Records Center, Box NA1045, Folder L.&P.C. 77/3, NA, RG 77. In 1905 the works at the Louisville and Portland canal consisted of 125 acres of land, the canal and locks, a dry dock; automatic gate, movable dam at head of canal, three draw-bridges across the canal and locks; 6 lock-engine houses; residence and office for assistant engineer; stone machine shop; boiler house; stone and brick blacksmith shop; power house; store house; frame carpenter shop; planing and saw mill; frame coal bin; branch office at head of canal; and floating plant, which included one towboat (probably the *Walker Morris*), three dredges, six mud scows, and four barges. The dry docks could handle vessels as large as 225 feet by 54 feet, and was used for construction and repair of government floating plant and rented to private boatowners when not in use. The equipment and structures at the canal not connected immediately with lock operation eventually were designated the Louisville Repair Station and were still in operation in 1975.

28. ARCE, 1883, pp. 1527-28, 1533; William E. Merrill to Editor, *Louisville Times*, August 17, 1885, in "Appointments to Various Positions on Louisville and Portland Canal, May 15, 1884-December 14, 1893," Office of Administrative Services, Louisville Engineer District, Louisville, Kentucky. This manuscript volume of correspon-

dence was preserved by various employees of the District over the years, and in 1972 was bound and filed in a vault in ORLAS. It is cited hereinafter as "LPC Letterbook."

29. Affidavit of Philip Gebertshan, July 31, 1886, in "LPC Letterbook."

30. O. H. Stratton to William E. Merrill, June 3, 1885, *ibid.*

31. John M. Wilson to William E. Merrill, June 9, 1885, *ibid.*; W. E. Merrill to John Newton, July 23, 1885, *ibid.*

32. *Louisville Democrat*, November 19, 1885; *Louisville Courier-Journal*, October 8, 1885.

33. William E. Merrill to John Newton, December 23, 1885, in "LPC Letterbook"; William E. Merrill to Pink Varble, January 8, 1886, *ibid.*; William E. Merrill to John Newton, October 20, 1885, *ibid.*

34. Simon B. Buckner to William E. Merrill, January 11, 1886, *ibid.*; W. E. Merrill to Editor, *Commercial Gazette*, February 3, 1886, *ibid.*; John M. Wilson to William E. Merrill, February 4, 1886, *ibid.*; William E. Merrill to John Newton, February 6, 1886, *ibid.* Biographical information related to Thomas H. Taylor may be located in Ezra J. Warner, *Generals in Gray: Lives of the Confederate Commanders* (Baton Rouge, 1959), pp. 300-01, and "Memo Relating to General Thomas H. Taylor," Secretary of War to Engineer Department, n. d., "Letters Received, Engineer Department, 1886 (No. 1286)," NA, RG 77.

35. William E. Merrill to John MacLeod, February 13, 1886, in "LPC Letterbook"; Amos Stickney to J. P. Claybrook, March 24, 1887, *ibid.*; *ARCE*, 1886, p. 1569. Major Stickney moved into an office at 507 W. Chestnut. In 1893 the office was relocated to the fourth floor of the U. S. Customhouse at 4th and Chestnut; in 1932 it moved to a new Federal Building at 6th and Broadway; in 1946 it moved to the Gibbs-Inman Building at 830 West Broadway — the building was purchased by the United States; and in 1975 the District office was located in an imposing new Federal Building in downtown Louisville.

36. Albert S. Willis to W. C. Endicott, June 8, 1886, in

Engineer Department, "Letters Received, 1886. (No. 2677 B/417)," NA, RG 77; Albert Willis to Secretary of War, October 15, 1886, in "LPC Letterbook."

37. Amos Stickney to Thomas L. Casey, April 10, 1889, in "LPC Letterbook"; Thomas L. Casey to Amos Stickney, May 6, 1889, *ibid.*; *ARCE*, 1889, p. 1913.

38. C. O. Bradford to President of United States, October 18, 1889, "LPC Letterbook"; anonymous to G. J. Lydecker, June 25, 1891, *ibid.*; Thomas Costello to President Benjamin Harrison, June 10 and June 18, 1891, *ibid.*

39. R. R. Jones to Edward Maguire, May 30, 1890, *ibid.*; G. J. Lydecker to Chief of Engineers, June 29, 1891, *ibid.*; L. A. Grant to Chief of Engineers, August 30, 1892, *ibid.*

40. G. J. Lydecker to Thomas L. Casey, October 1, 1892, *ibid.*; H. M. Adams to G. J. Lydecker, March 24, 1893, *ibid.*; "Memorandum made at the request of those who signed the petitions from Pittsburgh and Cincinnati river interests to the President," received by OCE on March 27, 1893, *ibid.*; *ARCE*, 1894, p. 1940.

41. *ARCE*, 1894, p. 1940; "Hiram Martin Chittenden, M. ASCE," *Transactions of American Society of Civil Engineers*, LXXXII (1918), 1675-78. An illustrated account of Chittenden's work at Yellowstone National Park is Francis X. Kelly, "Early Preservation of 'Pleasuring Grounds,'" *Water Spectrum*, IV (Fall, 1972), 37-41.

42. Secretary of War to Chief of Engineers, June 25, 1897, in "General Correspondence, 1894-1923," NA, RG 77.

43. Chief of Engineers, "Memorandum for the Secretary of War," attached to William H. Taft to J. M. Dickinson, January 19, 1911, in "General Correspondence, 1894-1923," NA, RG 77, summarized the history of the political troubles at Louisville canal.

44. *Ibid.*

45. *Ibid.*

46. Lytle Brown, "Federal River and Harbor Policies," *Civil Engineering*, V (August, 1935), 462.

## CHAPTER IX: FOOTNOTES

1. Verhoeff, *Kentucky River Navigation*, p. 18n; "River Navigation in Indiana," *Indiana Magazine of History*, II (March, 1906), 89-93; Logan Esarey, "Internal Improvements in Early Indiana," *Indiana Historical Society Publications*, V (1912), 60-61.

2. Godfrey Weitzel to H. M. Rice, November 30, 1878, Wetzel Letterbook, Manuscript Division, Cincinnati Historical Society.

3. Officers of the Corps of Engineers surveyed the portages between the Wabash and the Great Lakes on several occasions during the nineteenth century; and the Cross-Wabash Waterway was still under study in 1975.

4. *Niles' Weekly Register*, XL (May 21, 1831), 194; *Western Sun*, June 17, 1826; Fort Wayne Public Library, *Boatmen on the Wabash*, 1830 (pamphlet; Fort Wayne, 1954), *passim*; Donald F. Carmony, "Flatboat Building on Little Raccoon Creek, Parke County, Indiana," *Indiana Magazine of History*, LX (December, 1964), 305-22; Eleanore A. Cammack, "Notes on Wabash River Steamboating: Early Lafayette," *Indiana Magazine of History*, L (March, 1954), 35-50; William E. Wilson, *The Wabash* (New York, 1940), pp. 177, 266-67.

5. Esarey, "Internal Improvements in Early Indiana," pp. 63-65; copy of the Polke-Hinde report is inclosed in John L. Smith to Charles Gratiot, February 7, 1831, "Letters Received by Topographical Bureau, 1824-1865," (S. 1219) NA, RG 77.

6. U. S., Congress, House, *Wabash River*, H. Doc. No. 208, 22 Cong., 1 Sess., 1832, *passim*.

7. U. S., Congress, Senate, Committee on Roads and Canals, Report on "A Bill to Improve the Navigation of the Wabash River," S. Ex. Doc. No. 164, 23 Cong., 1 Sess., 1834, *passim*; Esarey, "Internal Improvements in Early Indiana," pp. 76-77; U. S., Congress, House, *Message from the President of the United States to the Two Houses of Congress*, H. Ex. Doc. No. 2, 23 Cong., 2 Sess., 1834, pp. 21-22.

8. *ARCE*, 1873, pp. 512-17; Hunter, *Steamboats on Western Rivers*, p. 186; U. S., Congress, House, *Site For a Western Armory*, H. Ex. Doc. No. 133, 27 Cong., 3 Sess., 1843, pp. 239-41.

9. *ARCE*, pp. 485-90.

10. *ARCE*, 1873, pp. 510-17; *ARCE*, 1877, pp. 667-73; *ARCE*, 1879, pp. 1439-60.

11. *ARCE*, 1877, pp. 667-73; *ARCE*, 1879, pp. 1439-60.

12. *ARCE*, 1879, pp. 1439-60; *ARCE*, 1883, p. 1589.

13. *ARCE*, 1886, pp. 1582-83; *ARCE*, 1895, pp. 2443-44; *ARCE*, 1894, p. 1945.

14. *ARCE*, 1898, pp. 1980-81; *ARCE*, 1904, pp. 2729-41.

15. W. P. Greene, ed., *The Green River Country from Bowling Green to Evansville, Its Traffic, Its Resources, Its Towns, and Its People* (Evansville, 1898), pp. 11, 127-28; Gilliam J. Johnson (old Green River raftsmen), private interview, August 6, 1971.

16. *Louisville Public Advertiser*, January 15, 1831, prints

an account of the voyage of the *McLean* by its pilot, J. O. Curry, See, however, statement that the first steamboat to reach Bowling Green was the *United States* and supporting evidence in Helen B. Crocker, "Green River Steamboating: A Cultural History, 1828-1931" (unpublished master's thesis, Western Kentucky University, 1970), p. 20. Consult the history of the slackwater projects of Kentucky in Joe F. Decker, "The Board of Internal Improvement of Kentucky, 1835-1850" (unpublished master's thesis, University of Louisville, 1964). Correspondence relating to Army Engineer survey of the Green and Barren rivers may be located in "Registers of Letters Received, Topographical Bureau, 1824-1866," NA, RG 77. An account of construction of the Green-Barren project written by the state engineer is printed in U. S., Congress, House, *Survey of the Ohio River*, H. Ex. Doc. No. 72, 41 Cong., 3 Sess., 1871, pp. 48-49, 53-54.

17. U. S., Congress, House, *Survey of the Ohio River*, H. Ex. Doc. No. 72, 41 Cong., 3 Sess., 1871, pp. 48-49, 53-54; Kentucky Board of Internal Improvement, *Report from the Board of Internal Improvement* (pamphlet; Frankfort, 1843), pp. 10-16.

18. See note 17 above.

19. *Louisville Journal*, December 7, 1841; Kentucky Board of Internal Improvement, *Report from the Board of Internal Improvement* (Frankfort, 1843), pp. 5-6; Crocker, "Green River Steamboating: A Cultural History, 1828-1931," pp. 21-34.

20. W. P. Greene, ed., *The Green River Country* . . . , pp. 15-17; ARCE, 1880, pp. 1823-24.

21. W. S. Overstreet to E. H. Ruffner, September 8, 1902, "General Correspondence, 1894-1923," NA, RG 77; Don C. Buell, *Memorial of D. C. Buell and Others Concerning the Green and Barren River Navigation Company and Its Relation to the Green River Country* (Airdrie, Ky., 1880), *passim*; U. S., Congress, House, *Green and Barren River Navigation Company*, H. Ex. Doc. No. 111, 49 Cong., 2 Sess., 1887, p. 14.

22. ARCE, 1880, 1799-1824; ARCE, 1885, pp. 1904-16.

23. Crocker, "Green River Steamboating: A Cultural History, 1828-1931," pp. 84-114, provides an extensive discussion of the company and steamboat commerce of the era. ARCE, 1889, pp. 84-114; Calhoun *Constitution*, February 20, 1890; Edward B. Clark, *William L. Sibert, The Army Engineer* (Philadelphia, 1930), p. 26.

24. ARCE, 1890, pp. 2259-60; ARCE, 1891, p. 2439; Calhoun, Kentucky, *Constitution*, February 20, March 26, July 29, August 26, September 30, 1890; Calhoun, *Kentucky Courier*, December 11, 1890 (the rather rare copies of the Calhoun newspapers are located at Kentucky Library, Western Kentucky University, Bowling Green); Crocker, "Green River Steamboating: A Cultural History, 1828-1931," p. 117.

25. Calhoun *Constitution*, March 19, 1890; ARCE, 1885, pp. 1894-99.

26. ARCE, 1891, pp. 2446-48; ARCE, 1895, pp. 2481-82; W. P. Greene, ed., *The Green River Country* . . . , p. 58; ARCE, 1889, pp. 2599-2604; Samuel B. Settle, "William McLaurine Hall, M. ASCE," *Transactions of American Society of Civil Engineers*, CXVII (1952), 1301-02.

27. ARCE, 1889, pp. 2599-2604; ARCE, 1898, p. 2011; Louisville District, "Preliminary Draft of Comprehensive Plan" (manuscript report to OCE, October 3, 1913), in Kansas City Federal Records Center, Box NA1044, Folder 1943/19/Misc, NA, RG 77.

28. ARCE, 1880, pp. 1802-22.

29. ARCE, 1891, pp. 2474-82; W. P. Greene, ed., *The Green River Country* . . . , pp. 56-58; Crocker, "Green River Steamboating: A Cultural History, 1828-1931," pp. 117-22.

30. Cincinnati District, *Histories of Navigation on the Ohio and Kentucky Rivers and Engineering Projects in the Cincinnati U. S. Engineer District* (rare pamphlet in NA1141, Misc. 20, NA, RG 77; Cincinnati, 1937), p. 28; Verhoeff, *Kentucky River Navigation*, pp. 95-96; John W. Cole-

man, *Steamboats on the Kentucky River* (pamphlet; Lexington, 1960), pp. 6-7; Thomas D. Clark, *The Kentucky* (New York, 1943), pp. 72-87; *Louisville Public Advertiser*, October 27, 1818.

31. Verhoeff, *Kentucky River Navigation*, pp. 24-27; Cincinnati District, *Histories of Navigation on the Ohio and Kentucky* . . . , pp. 19-23; U. S., Congress, House, *Survey - Kentucky River*, H. Doc. N. 58, 20 Cong., 2 Sess., 1829, *passim*. The maps prepared during the 1828 survey were on file in Louisville Engineer District for many years; about 1965 they were deposited in the National Archives, but a microfilm copy is located in Surveys Branch, Louisville Engineer District, under the title "Kentucky River Maps and Survey, 1829-1946."

32. ARCE, 1879, pp. 1400-01; Verhoeff, *Kentucky River Navigation*, pp. 104-06 (see Appendix also).

33. *Frankfort Commonwealth*, September 27, 1834; ARCE, 1879, p. 1408.

34. Verhoeff, *Kentucky River Navigation*, pp. 29-32; Coleman, *Steamboats on the Kentucky River*, pp. 13-14, 25-26; ARCE, 1898, p. 2012. *Haldeman's Picture of Louisville, Directory and Business Advertiser, for 1844-1845*, p. 77, commented: "Since the State's improvements on this noble river have been completed, a vast amount of produce, from the rich and productive counties of the interior, is brought to Louisville, by this channel, which formerly came over land, at greatly enhanced freights." The *New Argo*, Captain Armstrong, was the first steamboat to pass through the locks, arriving at Frankfort, Kentucky, on February 14, 1840. See M. R. Stealey, Resident Engineer, to Sylvester Welch, Chief Engineer of Kentucky, December 1, 1840, in *Journal of the Franklin Institute*, XXXI (May, 1841), 377-79.

35. Verhoeff, *Kentucky River Navigation*, pp. 32-33; Cincinnati District, *Histories of Navigation of the Ohio and Kentucky* . . . , pp. 23-24, 28; and notes in *Engineering News*, V (March 7 and April 25, 1878), 74, 129.

36. ARCE, 1879, pp. 1410-10; ARCE, 1880, pp. 1825-27.

37. ARCE, 1882, pp. 1945-51; ARCE, 1885, pp. 1869-83; Coleman, *Steamboats on the Kentucky River*, pp. 31-34.

38. ARCE, 1883, pp. 1559-64; Verhoeff, *Kentucky River Navigation*, pp. 37-38; Clark, *The Kentucky*, pp. 321-38.

39. ARCE, 1884, pp. 1728-31; maps and diagrams of the site and structure are printed in *ibid.*, pp. 1731-46.

40. *Ibid.*; Cincinnati District, *Histories of Navigation on the Ohio and Kentucky* . . . , pp. 26-27; ARCE, 1890, p. 2263; ARCE, 1891, p. 2449.

41. J. Stoddard Johnston, "The Kentucky River in Its Relation to the Development of the Eastern Kentucky Coal Field," in *Kentucky Resources: Transportation Systems* (Frankfort, 1887), p. 57.

42. ARCE, 1898, pp. 2012-17; Verhoeff, *Kentucky River Navigation*, pp. 33-36. The Corps of Engineers reconstructed, repaired, and modified these structures many times after their completion. In March, 1905, for example, floods breached banks adjacent to Locks and Dams Nos. 9 and 10, and loss of pool resulted. Auxiliary dams were constructed to close the breaches and navigation was restored in 1906.

43. Holt, OCE, pp. 20-21; ARCE, 1872, pp. 420-25.

44. Ila Earle Fowler, "The Tradewater River Country in Western Kentucky," *Register of Kentucky Historical Society*, XXXII (October, 1934), 277-300; *Congressional Record*, 45 Cong., 2 Sess., VII, Pt. 3, 2747. The friend of Cox who made the remark was probably Congressman John G. Carlisle, a former Lieutenant Governor of Kentucky.

45. *Ibid.*, p. 2749.

46. ARCE, 1881, pp. 1991-94; ARCE, 1882, pp. 1959-63; ARCE, 1886, pp. 1617-18; ARCE, 1891, p. 2438.

47. ARCE, 1897, pp. 2477-81; U. S. Congress, House, *Tradewater River, Kentucky*, H. Doc. No. 179, 58 Cong., 2 Sess., 1903, *passim*.

48. Pross, "A History of Rivers and Harbors Appropriation Bills, 1866-1933," p. 71.

49. *Ibid.*, p. 238; ARCE, 1893, p. 2546. See also "Government Engineering," *Engineering News*, VI (December 6, 1879), 393; and Emory R. Johnson, *Inland Waterways, Their Relation to Transportation* (Annals of American Academy of

*Political and Social Science* supplement, September, 1893; Philadelphia, 1893), p. 119.

50. President Taft is quoted in "No More 'Pork Barrels,'" *Literary Digest*, XLI (July 9, 1910), 39-42.

## CHAPTER X: FOOTNOTES

1. U. S., Congress, House, *Survey of the Ohio River*, H. Ex. Doc. No. 72, 41 Cong., 3 Sess., 1871, *passim*.

2. ARCE, 1869, p. 52; *Pittsburgh Commercial*, May 22, 1875; Louisville *Courier-Journal*, August 1-2, 27, 1869; Frederick Way, "The Early Lighthouse Service," *S&D Reflector*, VII (June, 1970), pp. 37-40; Hunter, *Steamboats on Western Rivers*, pp. 247-48.

3. ARCE, 1867, pp. 40-41, 402-04; ARCE, 1868, pp. 680-88; ARCE, 1869, pp. 352-68.

4. W. Milnor Roberts to Chief of Engineers, March 15, 1870, in Engineer Department, "Registers of Letters Received, 1866-1870," NA, RG 77; John Bogart, "William Milnor Roberts, Past President, ASCE," *Transactions of American Society of Civil Engineers*, XXXVI (December, 1896), 531-37.

5. ARCE, 1870, pp. 406-16; ARCE, 1871, pp. 385-92; Margaret E. Merrill, "William E. Merrill," *Professional Memoirs*, IX (November-December, 1917), 639-42.

6. ARCE, 1873, p. 495; ARCE, 1872, pp. 398-406.

7. Hunter, *Steamboats on Western Rivers*, pp. 115-16; Theodore Allen, "Iron Hulls for Western River Steamboats," *Transactions of American Society of Civil Engineers*, II (1873), 271-87; ARCE, 1874, pp. 404-05; ARCE, 1876, II, 7; ARCE, 1877, p. 628; ARCE, 1924, p. 1259; Frederick Way, Jr., to Leland R. Johnson, May 12, 1972, author's personal files.

8. ARCE, 1873, pp. 495-96; ARCE, 1874, pp. 400-04; editorial note, *S&D Reflector*, VII (March, 1970), 24-25.

9. ARCE, 1879, p. 1308; William W. Harts, "Improvement of Rivers," *Professional Memoirs*, V (March-April, 1913), 139-61. In *Pittsburgh Commercial*, May 22, 1875, Colonel Merrill wrote:

The work thus far done on the Ohio has been limited to closing island chutes, where neither channel had a sufficiency of water, and to narrowing the channel by dikes or wing dams wherever the water was spread over a wide shoal. These works have been moderately successful, but it is well known to all engineers that in such a river as the Ohio, whose summer supply dwindles down to almost nothing, no radical improvement is possible by more concentration.

10. See complete report in U. S., Congress, House, *Survey of the Ohio River*, H. Ex. Doc. No. 72, 41 Cong., 3 Sess., 1871 (quotation on p. 6).

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Records Center, Box NA1141, Folder Ohio 450, NA, RG 77), *passim*; James A. Henderson, "Reminiscences of the Rivers," *Western Pennsylvania Historical Magazine*, XII (October, 1929), 235-36.

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19. U. S., Congress, *Report of the Select Committee on Transportation-Routes to the Seaboard*, S. Rept. No. 307, 43 Cong., 1 Sess., 1874 *passim* (see especially pp. 215-18); *Pittsburgh Commercial*, May 18, 1875.

20. ARCE, 1875, p. 686; ARCE, 1876, II, 11-14; editorial note in *Engineering News*, IV (December 8, 1877), 345.

21. ARCE, 1879, pp. 1299-1300; William E. Merrill to Morrison Foster, September 17, 1885, in Davis Island Dam, Letter Book No. 4, Philadelphia Federal Records Center, NA, RG 77; William E. Merrill to George Dewey, October 16, 1882, in Davis Island Dam, Letter Book No. 2, *ibid.* Complete description of the project, including diagrams and photographs, was prepared by the project engineer and printed in William Martin, "Davis Island Dam, Ohio River," *Engineering News*, XV (May 15, 1886), 306-11.

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23. See note 22 above.

24. ARCE, 1886, p. 1528; Frederick Way, "Davis Island Dam Celebration," *S&D Reflector*, III (June, 1966), pp. 1, 6; Louisville *Courier-Journal*, October 8, 1885; Pittsburgh *Evening Penny Press*, October 7, 1885; Pittsburgh Chamber of Commerce, *Reports to the Chamber upon the Opening of Davis Island Dam, Together with Interest-Data* (pamphlet; Pittsburgh, 1886), *passim* (Merrill is quoted on p. 29).

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26. ARCE, 1885, p. 1799-1800; ARCE, 1889, p. 1878; editorial note, *Engineering News*, XXII (July 27, 1889), 73; ARCE, 1891, pp. 2350-51; J. W. Arras, "Locks and Movable Dams of the Ohio River," *Professional Memoirs*, III

(October-December, 1911), 546-50.

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34. U. S., Congress, House, *Ohio River*, H. Doc. No. 492, 60 Cong., 1 Sess., 1908, p. 6, 68.

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356-68; Charles McD. Townsend, "Decline of Water Transportation on Western Rivers," *Professional Memoirs*, II (January-March, 1910), 20-29; U. S., Congress, House, *Ohio River*, H. Doc. 492, 60 Cong., 1 Sess., 1908, pp. 16-21.

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37. Kentucky Legislature to Chief of Engineers (copy of Memorial to Congress), April 25, 1906, in Engineer Department, "General Correspondence, 1894-1923," NA, RG 77.

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41. *Ibid.*, pp. 115-16.

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12. George M. Hoffman to Chief of Engineers, July 23, 1920, OCE, "General Correspondence, 1894-1923," NA, RG 77.

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14. G. R. Lukesh to C. W. Kutz, March 17, 1923, OCE, "General Correspondence, 1894-1923," NA, RG 77.

15. Edward B. Clark, *William L. Sibert, the Army Engineer, passim*.

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33. See note 32 above, and John C. Oakes to Chief of Engineers, June 10, 1916, in OCE, "General Correspondence, 1894-1923," NA, RG 77.

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and Harbors, *Transportation on the Ohio River System*, pp. 11-12; ARCE, 1926, p. 1157; Ambler, *Transportation in Ohio Valley*, pp. 444-46.

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## CHAPTER XII: FOOTNOTES

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10. ARCE, 1884, pp. 1689-92; ARCE, 1885, pp. 1796-98.

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21. *Ibid.*, pp. 227, 292-93; Hiram M. Chittenden, "Detention Reservoirs with Spillway Outlets as an Agency in Flood Control," *Transactions of American Society of Civil Engineers*, LXXXII (1918), 1493.

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25. John W. Lane, "Flood Control — Ohio Leads the Way," *Ohio Contractor*, September, 1968, n. p.

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perform this type of report.

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28. U. S., Congress, House, *Prevention of Damage by Floods*, H. Doc. No. 914, 63 Cong., 2 Sess., 1914, *passim*; U. S., Congress, House, *Flood Protection and Prevention*, H. Doc. No. 1792, 64 Cong., 2 Sess., 1916, *passim*. Major Oakes of Louisville District stated it as his opinion that the "inhabitants of the Ohio River Valley are demanding, and are going to obtain an investigation" of flood control, and recommended thorough and comprehensive studies by the Corps. On the other hand, there were Corps officers who opposed comprehensive flood control planning. Colonel Charles McD. Townsend wrote: "The systematic conservation and regulation by the Government of a river from its source to its mouth sounds most attractive, suggesting a scientific solution of every problem of river hydraulics, but instead I greatly fear that it is the voice of a siren luring the people to an open pork barrel for every stream in the United States." See John C. Oakes to Senior Member, Board of Officers on River Floods, November 22, 1915, in Engineer Department, "General Correspondence, 1894-1923," NA, RG 77; And Charled McD. Townsend, "Control of River Floods," *Professional Memoirs*, V (July-August, 1913), 429.

29. *Rivers and Harbors Laws*, III, 1706-07, 1885; *ARCE*, 1927, p. 5; *ARCE*, 1951, Pt. I, Vol. III, 228-29.

30. *Congressional Record*, April 9, 1930, p. 7092.

31. T. P. Pendleton, "Photographing the Wabash," *Military Engineer*, XXIII (July-August, 1931), 345-51; Maybin H. Wilson, "Contract Mapping in the Louisville District," *ibid.*, pp. 340-44 (quote on 344).

32. U. S., Congress, House, *Wabash River, Ohio, Indiana, and Illinois*, H. Doc. No. 100, 73 Cong., 1 Sess., 1934, pp. 91-95; Gilbert Van B. Wilkes to Dabney O. Elliott, May 18, 1935, in Kansas City Federal Records Center, Box NA1119, Folder 1713.1/188, NA, RG 77.

33. U. S., Congress, House, Committee on Flood Control, *Comprehensive Flood Control Plan: Hearings on H. R. 7393*, 75 Cong., 1 Sess., 1937, pp. 401-02.

34. U. S., Congress, House, *Green, Baren, and Rough Rivers, Ky.*, H. Doc. No. 81, 73 Cong., 1 Sess., 1933, pp. 1-5.

35. *Ibid.*

36. U. S., Congress, House, *Ohio River*, H. Doc. No. 306, 74 Cong., 1 Sess., 1936, *passim* (see especially pp. 1-7); Douglas L. Weart and J. W. Bruce, "Ohio River Basin Flood Control Plan," *Military Engineer*, XL (August, 1948), 345-47.

37. See note 36.

38. See note 36.

39. "Record Floods from New England to the Potomac," *Engineering News-Record*, CXVI (March 26, 1936), 441-42.

40. "Restore and Protect!" *Engineering News-Record*, CXVI (March 26, 1936), 471; editorial note, *ibid.*, CXVI (May 28, 1936), 793; *ARCE*, 1936, pp. 3, 6.

41. *ARCE*, 1936, pp. 1144-45.

42. Paschal N. Strong, "The Great Flood of the Ohio" *Military Engineer*, XXIX (May-June, 1937), 157; Louisville District Engineer to Chief of Engineers, December 2, 1937, incloses "Report on flood of January-February, 1937 — Louisville District," in Kansas City Federal Records Center, Box NA1115, Folder 1713.33/555, NA, RG 77.

43. See note 42, and Stanley J. Horn, "The Flood of 1937 in the Ohio Valley: Cause, Magnitude, and Possibility of Recurrence: General Plan for Future Protection Works," *Civil Engineering*, VII (May, 1937), 326-28.

44. George P. Stimson, "River on a Rampage: An Account

of the Ohio River Flood of 1937," *Cincinnati Historical Society Bulletin*, XXII (April, 1964), 91-109; U. S., Congress, House, Committee on Flood Control, *Comprehensive Flood-Control Plans: Hearings on Report of Chief of Engineers, April 6, 1937*, 75 Cong., 3 Sess., 1938, p. 423, quotes Victor M. O'Shaughnessy of Lawrenceburg.

45. Gustave A. Breau, "1937 Flood at Louisville," *Filson Club History Quarterly*, XI (April, 1937), 109-18; Strong, "The Great Flood of the Ohio," p. 160. See also newspaper files for the period.

46. Louisville District, "Report of Damage Survey, Flood of January-February, 1937, Louisville District," dated July, 1937, in Kansas City Federal Records Center, Box NA1114, Folder 1713.33/7, NA, RG 77; Lockmaster Thomas J. Reid, Lock and Dam No. 44, log for the flood period is printed in *S&D Reflector*, VI (March, 1969), 2.

47. U. S., Congress, House, Committee on Flood Control, *Comprehensive Flood Control Plan for Ohio: Hearings on H. R. 7393 and H. R. 7646*, 75 Cong., 1 Sess., 1937, pp. 33-34, 109.

48. *Ibid.*, p. 6; Louisville District, "Report of Damage Survey, Flood of January-February, 1937, Louisville District," *passim*.

49. John Eschrick, "He Knows the Fury of War and Floods," *Louisville Courier-Journal*, April 7, 1946, describes the experiences of B. B. Talley and his conversation with OCE. B. B. Talley, who served as Louisville District Engineer, 1946-48, was the author of *Engineering Applications of Aerial and Terrestrial Photogrammetry* (New York: Pitman Publishing Corp., 1938).

50. Strong, "The Great Flood of the Ohio," pp. 157-58.

51. Oren H. Bellis (retired, Louisville District), private interview, February 26, 1973.

52. *Ibid.*

53. John H. Kurrasch (retired, Louisville District), private interview, February 27, 1973.

54. Testimony of R. G. Powell, June 9, 1937, in U. S., Congress, House, Committee on Flood control Plan for Ohio: *Hearings on H. R. 7393 and H. R. 7646*, 75 Cong., 1 Sess., 1937, pp. 92-97; "Superflood Devastates Lower Ohio and Now Threatens Mississippi Levee System," *Engineering News-Record*, CXVIII (February 4, 1937), 205. Logs of the vessels of the Engineer fleet during the flood emergency are also of interest and may be located in Kansas City Federal Records Center, NA, RG 77.

55. Telegram dated January 21, 1937, in Kansas City Federal Records Center, Box NA1114, Folder 1713, 33/30, NA, RG 77. The Louisville District had eleven field parties, comprised of 60 men, engaged in collection of hydraulic data during the flood.

56. Manuel Faust to Franklin Roosevelt, January 29, 1937, in OCE, "Civil Works, 1923-42, Rivers and Harbors Files," NA, RG 77; A. Stiker to the President, February 5, 1937, *ibid.*; Theodore B. Floto to the President, January 30, 1937, *ibid.* These communications, along with many others, are filed in Box 1243 of *ibid.*

57. Greater New York Federation, National Negro Congress to Franklin Roosevelt, February 8, 1937, in *ibid.*

58. U. S., Congress, House, Committee on Flood Control, *Comprehensive Flood Control Plan for Ohio: Hearings on H. R. 7393 and H. R. 7646*, 75 Cong., 1 Sess., 1937, pp. 1-12; U. S. Army, Corps of Engineers, Ohio River Division, *Ohio Valley Flood Control Plan* (pamphlet: Cincinnati, 1940), *passim*.

59. *ARCE*, 1937, p. 1067; Louisville District, "History of Louisville District, Corps of Engineers," n. p.; Louisville District, Public Affairs Office, File 206-09 O. R., provides information on Mr. S. M. Bailey.

## CHAPTER XIII: FOOTNOTES

1. Isabel M. McMeekin, *Louisville, The Gateway City* (New York, 1946), pp. 253-54, discusses the history of Jeffersonville Quartermaster Depot.
2. See reviews of the work of the Cantonment and Construction Division and General Goethals' recommendations in notes printed in *Engineering News-Record*, LXXX (March 7, 1918), 482; *ibid.*, LXXXI (September 12, 1918), 512; *ibid.*, LXXXIV (June 24, 1920), 1271.
3. Quartermaster Department, Construction Division, "Completion Report: Camp Knox, Kentucky" (unpublished report dated September 1, 1919, in "Completion Reports, 1917-43," NA, RG 77), *passim*; W. H. Radcliffe, "Completion Report, Camp Knox, Kentucky" (unpublished report dated 1919 in LDHF), *passim*.
4. See note 3 above.
5. McMeekin, *Louisville, The Gateway City*, pp. 249-51, reviews the history of Fort Knox.
6. Morgan, *The Miami Conservancy District*, pp. 353-54; Maurer Maurer, "McCook Field, 1917-27," *Ohio Historical Quarterly*, LXVII (January, 1958), 21-34.
7. *Ibid.*; Constructing Quartermaster, Dayton, Ohio, "Completion Report: Wright Field, Dayton, Ohio" (unpublished report dated 1926; in "Completion Reports, 1917-43," NA, RG 77), *passim*.
8. E. C. Itschner, "The Army Engineers' Contributions to American Defense and Advancement," text of address at Washington, D. C., April 3, 1959, pp. 9-10; "What the American Army Engineers Did in the War," *Engineering News-Record*, LXXXII (May 15, 1919), 953-54; *ibid.*, LXX-XIII (December 11, 1919), 1030; *ARCE*, 1918, pp. 5, 2954; *ARCE*, 1919, p. 3133. There was an attempt to sabotage a lock in the Nashville Engineer District in 1917.
9. Ambler, *Transportation in Ohio Valley*, pp. 423-26; Lansing H. Beach to Louisville District Engineer, May 25, 1917, in Kansas City Federal Records Center, Box NA1044, Folder Misc. 5020/1, NA, RG 77; Report of William H. McAlpine, April 8, 1918, in *ibid.*, Folder Misc. 5112/7.
10. *ARCE*, 1917, pp. 2905-06; Robert R. Jones, "The Ohio River," pp. 73-76; "Commerce and Navigation on the Ohio" (undated three page manuscript, Ohio River Division Historical Files, Cincinnati), *passim*.
11. *ARCE*, 1920, p. 24.
12. War Department, Office of Chief of Engineers, "Rationale of Inland Waterway Transportation" (unpublished manuscript, dated 1940 and probably written by William H. McAlpine, NA, RG 77), pp. III-2-3. The use made of the Ohio River and tributary waterways during the Second World War is reviewed herein in Chapter XIII.
13. *ARCE*, 1942, p. 4. The mission transfer was authorized by Public Law No. 326, 77th Congress, December 1, 1941.
14. *ARCE*, 1941, p. 5.
15. Henry Hutchings, Jr., to Administrator, C. A. A., Department of Commerce, October 9, 1942, in "Civil Works, 1923-1942, District Files," NA, RG 77; Louisville District, "Completion Report: Development of Staniford Field, Louisville, Ky." (unpublished report dated 1943, in "Completion Reports, 1917-43," NA, RG 77), *passim*. Oren H. Bellis was Senior Engineer at the Staniford Field project.
16. "Airfield Paved with Local Materials," *Engineering News-Record*, CXXX (March 18, 1943), 390-91, describes construction of a C.A.A. field in the Louisville District. For security reasons, the identity and location of the field was not mentioned in the article, but internal evidence indicates it was the field at Bowling Green, Kentucky.
17. Chief of Engineers to Ohio River Division Engineer, May 27, 1942, in "Airfield Files, 1943-45," NA, RG 77; Henry Hutchings, Jr., to Chief of Engineers, July 18, 1941, in *ibid.*; Louisville District, "Completion Report for Air Corps Construction, Godman Field, Fort Knox, Kentucky" (unpublished report dated 1942 in "Completion Reports, 1917-43," NA, RG 77), *passim*; Quartermaster Department, Bowman Field Officers, "Completion Reports — Bowman Field," in *ibid.*, *passim*; McMeekin, *Louisville, The Gateway City*, pp. 251-52.
18. Eugene Stokes, retired engineer of Louisville District, private interview, August 15, 1972; *River Rises*, October, 1945, pp. 5-13 (*River Rises* was an inhouse publication of the Louisville District during the wartime period; a complete collection is owned by Chauncey Carr, Personnel Office, Louisville District).
19. *River Rises*, June, 1945, pp. 4-8; *ibid.*, October, 1945, pp. 5-13.
20. *Ibid.*, May, 1945, p. 2; *ibid.*, July, 1945, p. 6; E. E. Gesler to Charles W. Barber, October 24, 1942, in "Civil Works, 1923-1942, District Files," NA, RG 77.
21. Eugene Reybold, Chief of Engineers, to Division Engineer, Ohio River, October 27, 1942, in Ohio River Division Historical Files, Cincinnati, inclosed the plan for reorganization.
22. *Ibid.*, C. L. Hall to Chief of Engineers, November 13, 1942, in *ibid.*; Great Lakes Division Engineer to Ohio River Division Engineer, November 16, 1942, in *ibid.* The military projects of Nashville Engineer District were supervised by South Atlantic Division; in 1943 Louisville District took over projects in Western Kentucky formerly administered by Nashville District.
23. *River Rises*, June, 1945, pp. 4-8.
24. Bureau of the Budget, War Projects Unit, "Abstract of Field Reports, Seymour Advance Twin Engine School" (unpublished report dated 1942), in "Airfield Files, 1943-45," NA, RG 77; William N. Taylor to Inspector General, November 14, 1942, in *ibid.* Captain J. P. Case was Area Engineer at Seymour. Bureau of the Budget, War Projects Unit, "Abstract of Field Report: Lawrenceville, Illinois, Twin Engine School" (unpublished report dated 1942 in *ibid.*). Captain Edward H. Baldwin, Jr., was Area Engineer at George Field.
25. "Awarding of Army Contracts for Defense Plants Begins," *Engineering News-Record*, CXXV (August 22, 1940), 247-48; John A. Hunt to Inspector General, April 23, 1942, in "Geographic Files, 1943-45," NA, RG 77; Austin Griffith to Chief of Engineers, December 24, 1942, in "Airfield Files, 1943-45," in *ibid.*; W. C. Wright to Inspector General, September 20, 1945, in "Geographic Files, 1943-45," NA, RG 77; Morganfield Architect-Engineers, "Interim Report for Motorized Triangular Division Cantonment at Morganfield, Kentucky" (unpublished report dated 1941), in *ibid.*, John A. Hunt to Inspector General, April 15, 1942, in *ibid.* Major Rees Willard was Area Engineer at Atterbury; Major Sultan G. Cohen was Area Engineer at Breckinridge. Reports on many other installations in the District are available in the files listed above.
26. See note 25 above.
27. S. N. Karrick to Inspector General, April 4, 1942, in "Geographic Files, 1943-45," NA, RG 77; Area Engineer, Ohio River Ordnance Works, "Completion Report, Job No. M9 41-1: The Anhydrous Ammonia Plant of the Ohio River Ordnance Works, West Henderson, Henderson County, Kentucky" (unpublished report dated 1942), in "Completion Reports, 1917-43," NA, RG 77. Area Engineer was Major D. M. Shryer; Atmospheric Nitrogen Corporation was the contractor.
28. "Nation's Largest Powder Plant Built in 9 Months," *Engineering News-Record*, CXXVII (August 7, 1941), 188-89; John S. Bragdon to Deputy Chief of Engineers, July 6, 1945, in "Geographic Files, 1943-45," NA, RG 77; Joseph L. Misiora to Inspector General, February 22, 1943,

in *ibid.*; Winston Bros. Company, "History of the Construction of the Hoosier Ordnance Plant, Charlestown, Indiana" (2 vol. mimeo. report, 1942), in "Completion Reports, 1917-43," NA, RG 77.

29. G. H. Drewry to Chief of Engineers, February 9, 1942, in "Geographic Files, 1943-45," NA, RG 77; W. E. Kapp to Leslie R. Groves, February 27, 1942, in *ibid.*; Louisville District, "Completion Report, Job No. M1: Construction of Detonator Plant, Vigo Ordnance Plant, Terre Haute, Indiana" (unpublished report, 1943), in "Completion Reports, 1917-43," NA, RG 77; Area Engineer, Fall Creek Ordnance Plant, Louisville District, "Completion Report, Job No. M-1: Fall Creek Ordnance Plant, Indianapolis, Indiana" (unpublished report, 1943), in *ibid.* Completion Reports were filed on every military project and usually include photographs, diagrams, and other detailed information. These files should be consulted for information about any single project.

30. Area Engineer, Jefferson Proving Ground, Madison, Indiana, "Completion Report: Jefferson Proving Ground, Madison, Indiana" (unpublished report, 1942), in *ibid.*

31. Louisville District, "Completion Report Job T-1, Billings General Hospital, Fort Benjamin Harrison, Indiana" (unpublished report, 1942) in *ibid.*; William N. Taylor to Inspector General, November 13, 1942, in "Geographic Files, 1943-45," NA, RG 77.

32. Area Engineer, Darnall General Hospital, Danville, Kentucky, "Completion Report: Darnall General Hospital" (unpublished report, 1942), in "Completion Reports, 1917-43," NA, RG 77; William N. Taylor to Inspector General, November 7, 1942, in "Geographic Files, 1943-45," NA, RG 77; McMeekin, *Louisville, The Gateway City*, p. 252.

33. Eugene Reybold, "Engineers in World War II," *Military Engineer*, XXXVII (January, 1946), 24-29 (quote on p. 27).

34. W. C. Wright to Inspector General, September 20, 1945, in "Geographic Files, 1943-45," NA, RG 77; *River Rises*, November, 1945, pp. 3-7. During the war Engineer Redistribution Centers Nos. 1-3 were located in Louisville at 516 W. Main, 227 E. Lee, and at 26th and Canal streets. The Military Property Section and Salvage Branch were located in the Kenyon Building at 112 S. Fifth Street.

35. William F. Tompkins to George H. Rehm, April 17,

36. Oren H. Bellis, private interview, February 26, 1973. Lenore Fine and Jesse A. Remington, *The Corps of Engineers: Construction in the United States* (Washington, 1972), is the definitive history of military construction in the United States, 1940-1946.

37. *River Rises*, October, 1945, pp. 5-13; Secretary of War to Comptroller General, July 24, 1944, in "Military Records, District Offices, Louisville (File 132.2)," NA, RG 77.

38. Whiteney I. Gregory, "The Louisville District under Col. B. B. Talley" (3 page manuscript dated July 27, 1948, in LDHF); "History of Louisville District Real Estate Division, 23 July 1947-31 December 1965" (manuscript in Ohio River Division Historical Files, Cincinnati).

39. See note 38 above, and "Korea" (2 page manuscript in Ohio River Division Historical Files, Cincinnati).

40. *Ibid.*; "Summary of Important Operations, Louisville District, Corps of Engineers, during Colonel C. Bidgood's Three-Year Tenure as District Engineer" (6 page manuscript in LDHF).

41. "Statement of Missions: U. S. Army Engineer District, Louisville" (manuscript dated October 14, 1957 in LDHF); Louisville District, "History of Louisville District, Corps of Engineers" (pamphlet dated April, 1968, in LDHF), n. p.; Eugene Stokes, retired engineer, Louisville District, private interview, August 15, 1972.

42. U. S. Army, Corps of Engineers, *The Corps of Engineers: The Contributions of Its Civil Works to National Preparedness* (Washington, 1964), pp. 41-43.

43. ARCE, 1961, I, 51; Department of the Army, Office of Chief of Engineers, General Orders No. 12, 28 April 1961 (copy in LDHF); W. P. Leber to William F. Cassidy, July 23, 1965, (copy in LDHF); Louisville District, "History of Louisville District, Corps of Engineers," n. p.

44. Department of the Army, Office of Chief of Engineers, General Orders No. 24, 19 June 1970 (copy in LDHF); W. Roper to Frederick J. Clarke, July 2, 1970 (copy in LDHF). 1941, in "Civil Works, 1923-1942, Miscellaneous File," NA, RG 77; Louisville District, "Department of the Army, Corps of Engineers, Louisville District" (3 page manuscript dated October 1, 1948, in LDHF); ARCE, 1965, I, xxix; B. L. Robinson, "Remarks before the Texas Associated General Contractors Convention," text of address, December 6, 1954, Nashville District Historical Files.

## CHAPTER XIV: FOOTNOTES

1. Colonel C. L. Hall to editor, July 15, 1936, *Engineering News-Record*, CXVII (August 20, 1936), 281, provides the cost comparisons.

2. Charles F. Michiels, William F. Lail, and Robert E. Mytinger, "Current Trends in Ohio River Traffic and Equipment," *Journal of Waterways and Harbors Division ASCE*, LXXXVII (December, 1956), paper 1123.

3. U. S. Army, Corps of Engineers, Ohio River Division, *Navigation of the Ohio River* (Cincinnati, 1938), pp. 12-13.

4. *Ibid.*, pp. 15-16; C. L. Hall to Louisville District Engineer, May 4, 1934, incloses a draft of a paper on Ohio River navigation structures to be presented to the Brussels Congress on Navigation, in Kansas City Federal Records Center, Box NA1074, Folder 23.1/1494, NA, RG 77.

5. Edmund L. Daley, "The Mastery of the Ohio River," *Military Engineer*, XIX (May-June, 1927), 192; McAlpine, *Ohio River Improvement*, pp. 26-29.

6. C. L. Hall to Louisville District Engineer, May 4, 1934, in Kansas City Federal Records Center, Box NA 1074, Folder 23.1/1494, NA, RG 77.

7. *Ibid.*

8. *Ibid.*; John W. Arras, "Locks and Movable Dams of the Ohio River," *Professional Memoirs*, III (October-December, 1911), 535-61.

9. C. W. Kutz, "Ohio River Canalization — Its History and Possibilities," *Engineering News-Record*, CIV (March 13, 1930), 437; C. L. Hall, "Pack Ice and Movable Dams," *Military Engineer*, XXVI (July-August, 1934), 245-47. Col. C. L. Hall, Cincinnati District Engineer, said: "Too much credit can not be given to the men who actually did the fighting. The writer is District Engineer at Cincinnati, and is proud to be in charge of such brave, loyal and competent public servants."

10. Daley, "Mastery of the Ohio," p. 192; Seymour Reitman, "Anchor on the Castle," *Water Spectrum*, IV (Fall, 1972), pp. 33-35.

11. ARCE, 1934, p. 921, ARCE, 1935, p. 1049; Louisville District, "History of Louisville District, Corps of Engineers," n. p.

12. Charles K. Palmer, "Improvement of Navigation on the Ohio River," pp. 31-36; ARCE, 1932, p. 1245.

13. Louisville District, "History of Louisville District,

Corps of Engineers," n. p.; Whitney I. Gregory, "The Louisville District under Col. B. B. Talley," n. p.

14. Alexander S. Chamberlain, *The Role of the Ohio River in the Development of Ohio Valley Industry* (pamphlet; Cincinnati, 1960), p. 7; P. W. Loveland and T. P. Bailey, "Navigation on the Ohio River," *Military Engineer*, XLI (May-June, 1949), 174; U. S. Army, Corps of Engineers, *Report of the Federal Civil Works Program as Administered by the Corps of Engineers, U. S. Army, 1951* (Washington, 1952; ARCE, 1951, Pt. I, Vol. III), p. 48.

15. Haywood R. Faison, "Some Economic Aspects of Waterways Projects," *Transactions of American Society of Civil Engineers*, CXX (1955), 1486; "Markland" (unpublished manuscript; no author, no date, Public Affairs Office Files, Louisville District). Harry M. Mack, Chairman, Board of Trustees, Ohio Valley Improvement Association, testified before a Senate Committee in 1960 that:

We are confident, and I think it is self-evident, that low-cost water transportation afforded by the Ohio River and the abundant water supply that we have, coupled with the protection that we now have against the ravages of floods have constituted the principal basis for this remarkable industrial expansion. This huge flow of capital has greatly increased employment opportunities for the people of the valley and has contributed tremendously to their rapidly rising standard of living."

See U. S., Congress, Senate, *Water Resources, Hearings Pursuant to S. Res. 48*, 86 Cong., 2 Sess., 1960.

16. James W. Bruce, Dwight W. Keller, and James A. Neill, "Modern Facilities for Ohio River Navigation," *Journal of the Waterways and Harbors Division, ASCE*, LXXXIII (May, 1957), paper No. 1239; Eugene P. Fortson and George B. Fenwick, "Navigation Model Studies of New Ohio River Locks," *ibid.*, LXXXVI (June, 1960), 79-92.

17. See note 16.

18. "Markland," Public Affairs Office, Louisville District; Louisville District; Louisville District, *Information Bulletin*, August, 1972.

19. Bruce, Keller, and Neill, "Modern Facilities for Ohio River Navigation," paper No. 1239; Louisville District, *Information Bulletin*, November, 1972.

20. John W. Lane, "Lifeline to Mid-America," *Water Spectrum*, I (Summer, 1969), 17-18; Eugene Miller, Harry Thomas, and Herschel St. Ledger, "Unusual Design Features: Cannelton Locks and Dam" (manuscript of paper presented to ASCE, 1969, Engineering Division Office, Louisville District); Willard Roper to Frederick J. Clarke, July 2, 1970, in LDHF; Louisville *Courier-Journal*, July 27, September 5, 1972. The temporary lock at No. 52, Ohio River, was selected by the Chief of Engineers as one of the best designed projects in the nation in the year it was completed.

21. Willard Roper to William F. Cassidy, June 27, 1967, in LDHF; Louisville *Courier-Journal*, June 1, 1967; "A River Nightmare: Dam Jam," *Construction Digest*, June 22, 1967.

22. Louisville District, *Information Bulletin*, April, 1972; consult also Louisville newspapers for the period.

23. See note 22.

24. Louisville *Courier-Journal*, April 21-22, May 17, 1972.

25. *Ibid.*, July 12, July 19, 1972.

26. General Taylor is quoted in "Relation of the Ohio River and Its Tributaries to Transportation in the United States: A Symposium," *Transactions of American Society of Civil Engineers*, LXXXIX (1926), 1157.

27. The same general developments were true also on other Ohio River tributaries in upriver Engineer Districts, but not in all cases. The Monongahela river in Pittsburgh Engineer District was one of the exceptions.

28. ARCE, 1909, pp. 1879-81; James G. Warren to Chief of Engineers, September 8, 1909, in Kansas City Federal Records Center, Box NA1044, Folder Misc. 824, Nos. 2/3, NA, RG 77.

29. Dan C. Kingman to Secretary of War, August 11, 1915, in "General Correspondence, 1894-1923," NA, RG 77; G. R. Lukesh to Chief of Engineers, October 3, 1924, in OCE, "Civil Works, 1923-1942, Rivers and Harbors," NA, RG 77; Julian L. Schley to Secretary of War, March 30, 1938, in *ibid.*

30. Wabash River Improvement Association to President Theodore Roosevelt, December 5, 1903, in "General Correspondence, 1894-1923," NA, RG 77; Wabash River Improvement Association to Secretary of War, December 11, 1903, in *ibid.*

31. U. S., Congress, Senate, National Waterways Commission, *Final Report of the National Waterways Commission*, S. Doc. No. 469, 62 Cong., 2 Sess., 1912, pp. 13-16; U. S., Congress, House, *Wabash River, Ohio, Indiana and Illinois*, H. Doc. No. 100, 73 Cong., 1 Sess., 1934, p. 2.

32. W. A. Colston, *Statement and Brief on Behalf of the Chesapeake and Ohio Railway Company, Pere Marquette Railway Company, the New York, Chicago and St. Louis Railroad Company: Hearing before Lieut. Col. W. A. Johnson, Corps of Engineers, at Fort Wayne, Indiana, July 14, 1931* (pamphlet; Cleveland, 1931), *passim*; Paul Cribbins, "A Proposed Navigable Waterway for the Wabash and Maumee Rivers" (unpublished doctoral dissertation; Purdue University, 1959), *passim*; Willard Roper to William F. Cassidy, June 27, 1967, in LDHF.

33. *The Hoosier Waterfowl*, Fall, 1968, p. 12; *Wabash Plain Dealer*, October 24, 1968; *Chicago American*, October 27, 1968; *Marion Chronicle Tribune*, October 14, 1968; *Fort Wayne Journal Gazette*, October 23 and 31, 1968; Henry J. Wallace to Louisville District, n. d., in LDHF.

34. John T. Rhett to Division Engineer, May 10, 1971, in Public Affairs Office, Louisville District.

35. ARCE, 1904, p. 2470; Louisville District to Chief of Engineers, October 3, 1913, inclosing "Preliminary Draft of Comprehensive Plan," in Kansas City Federal Records Center, Box NA1044, Folder 1943/19/Misc., NA, RG 77.

36. ARCE, 1932, p. 1308; ARCE, 1949, p. 836; J. H. Fenwick to the President, March 16, 1933, in OCE, "Civil Works, 1923-1942, Rivers and Harbors," NA, RG 77. The Louisville District operated a suboffice at Bowling Green from 1888-1901 which supervised the Green-Barren River project. From 1901 to 1927, the project was supervised (by Master Overseer W. S. Overstreet for many years) from an office at Woodbury (Lock No. 4), Kentucky. The Owensboro Substation directed operation of the project from 1927 to 1947. During the 1930s flashboards were installed atop Dam No. 5, and snags and boulders were cleared from Nolin River and Bear Creek to aid in the movement of rock asphalt.

37. ARCE, 1931, p. 1409; ARCE, 1949, p. 836; ARCE, 1951, p. 1504; ARCE, 1961, p. 1098. In 1970 a houseboat, the *Rose Howe*, navigated up the Rough River to Hartford, Kentucky, the first to accomplish the trip in 25 years; and in 1972 a coal company proposed construction of a barge-loading terminal at Livermore, Kentucky, near the mouth of the river.

38. ARCE, 1951, p. 1502; Louisville District, "Improvement of Green River for Navigation" (7 page report in Public Affairs Office, Louisville District), *passim*; U. S., Congress, House, Committee on Public Works, *Rivers and Harbors Omnibus Bill, Hearings on H. R. 9859*, 83 Cong., 2 Sess., 1954, p. 453-72.

39. Louisville District, "Civil Works Activities; Corps of Engineers, Louisville District" (10 page report; 1960?, in LDHF), *passim*; ARCE, 1954, pp. 915-18; ARCE, 1955, pp. 872-73; *Central City Messenger*, April 13, 1961; ARCE, 1965, pp. 891-92; ARCE, 1966, p. 965.

40. Louisville District to Chief of Engineers, October 3, 1913, in Kansas City Federal Records Center, Box NA1044, Folder 1943/19/Misc.

41. ARCE, 1930, pp. 1392-93; ARCE, 1931, p. 1411; ARCE, 1949, p. 837; ARCE, 1958, pp. 982-83; Louisville District, "Civil Works Activities; Corps of Engineers, Louisville

District," *passim*.

42. L. H. Rand and W. W. Parker, "Preliminary Draft of Report on Comprehensive Plan for Improvement of Waterways Relating to the 2nd Cincinnati, O. District" (18 page report, dated 1913; in Kansas City Federal Records Center, Box NA1044, Folder 1943/17/Misc., NA, RG 77; ARCE, 1910, p. 1994).

43. ARCE, 1917, pp. 3017-21; ARCE, 1929, pp. 1294-95; ARCE, 1918, p. 3069; ARCE, 1919, p. 3122; Lucien S. Johnson to District Engineer, December 7, 1918, in "General Correspondence, 1894-1923," NA, RG 77.

44. Cincinnati District, *Histories of Navigation on the Ohio and Kentucky . . .*, pp. 29-30; ARCE, 1949, p. 835; *S&D Reflector*, IV (March, 1967), 32; *ibid.*, V (March, 1968), 2; *ibid.*, V (June, 1968), 2.

45. ARCE, 1952, p. 1442; Robert G. West to Arthur W. Pence, July 9, 1951, in Ohio River Division Historical Files; Louisville District, "Civil Works Activities; Corps of Engineers, Louisville District," *passim*.

46. Several analyses of the subject have been attempted. Consult Joseph R. Cordaro, "The Economic Development of the Ohio River Valley Due to the Influence of Water Transportation" (unpublished master's thesis, University of Louisville, 1965); Alexander S. Chamberlain, *The Role of the Ohio River in the Development of Ohio Valley Industry*, *passim*; National Waterways Conference, Inc., "The Value of Low-Cost Water Transportation to the Louisville Economy" (5

page report; copy in Public Affairs Office, Louisville District).

47. See note 46 above and the testimony of Marvin J. Barloon, Professor of Economics, Western Reserve University, before a Senate Committee in 1960 printed in U. S., Congress, Senate, *Water Resources, Hearings Pursuant to S. Res. 48*, 86 Cong., 2 Sess., 1960, pp. 3076-88. Professor Barloon said: (p. 3085)

The availability of a wide variety of low-cost steels, of aluminum, of industrial chemicals, electric power, and other direct products of river transportation have made this an attractive location, even to those whose managements may not have recognized the role the river played in laying the foundation for their decision to build here. Even those new industrial establishments which do not use the river have been constructed in the Ohio Valley, to a large extent, as an indirect consequence of low-cost navigation.

48. National Waterways Conference, Inc., "The Value of Low-Cost Water Transportation to the Louisville Economy," *passim*; Cordaro, "The Economic Development of The Ohio River Valley Due to the Influence of Water Transportation," pp. 54-57. On December 8, 1972, the Louisville-Jefferson County Riverport Authority initiated a study of the economic impact of Ohio River commerce on the Louisville area.

49. Louisville *Courier-Journal*, November 30, 1971; John W. Lane, "Lifeline to Mid-America," *Water Spectrum*, I (Summer, 1969), 15-18.

## CHAPTER XV: FOOTNOTES

1. *River Rises*, June, 1945, p. 6; *ibid.*, August, 1945, p. 12, summarized construction of these projects. For further details, consult the Louisville District section of the ARCE for 1937 through 1945.

2. ARCE, 1942, pp. 2, 5-6; ARCE, 1943, pp. 1106-13; U. S., Congress, House, Committee on Flood Control, *Flood-Control Plans and New Projects, Hearings on H. R. 4485*, 78 Cong., 1 Sess., 1943, pp. 61, 64.

3. ARCE, 1945, pp. 1511-27; U. S., Congress, House, Committee on Flood Control, *Emergency Flood-Control Work*, hearings on S. 938, 79 Cong., 1 Sess., 1945, pp. 6-9.

4. U. S., Congress, House, Committee on Flood Control, *Flood Control Bill of 1946, Hearings on H. R. 6597*, 79 Cong., 2 Sess., 1946, p. 203. O. Slack Barrett was president of OVIA at the time.

5. ARCE, 1946, pp. 2-3; "The Army Engineers' Program of Local Flood Protection" (5 page report, date 1965, in LDHF), *passim*; S. M. Bailey, R. E. Karlen, and Harry Pockras, "Local Flood Protection Projects, Ohio River Basin," *Journal of the Waterways and Harbors Division*, ASCE, LXXXVII (December, 1956), Paper No. 1128.

6. "The Army Engineers' Program of Local Flood Protection," *passim*; Louisville *Courier-Journal*, September 22, 1972.

7. ARCE, 1942, pp. 1195-96; Louisville District, *Project Maps and Data Sheets Covering Authorized Projects* (revised to 30 June 1970), FC 95. The latter source, which is regularly updated, provides maps, diagrams, photographs, and concise information about each project in the District; it is cited hereinafter as Louisville District, *Project Maps and Data*.

8. ARCE, 1947, pp. 1709-14; ARCE, 1948, p. 1899; Herbert C. Gee, "Flood Control: Public Works Investment Number 1" (4 page manuscript, n. d., in LDHF), *passim*.

9. ARCE, 1947, pp. 1705-07; Bailey, Karlen, and Pockras, "Local Flood Protection Projects, Ohio River Basin," *Journal of Waterways and Harbors Division*, ASCE, LXXXVII (December, 1956), Paper No. 1128.

10. Hazel Parker Haynes, "A Gift of a Floodwall," *Courier-Journal Magazine*, December 7, 1952.

11. ARCE, 1947, pp. 1619, 1673-76.

12. ARCE, 1940, p. 1405; Louisville District, *Survey Report for Flood Control: Wabash River and Tributaries, Indiana and Illinois* (4 vol. report, dated July, 1944, in Louisville District files), *passim*; ARCE, 1946, p. 1678; U. S., Congress, House, Committee on Flood Control, *Flood Control Bill of 1946, Hearings on H. R. 6597*, 79 Cong., 2 Sess., 1946, p. 268. The public hearing was held at Vincennes, Indiana, June 26, 1945. Samuel M. Bailey, Chief, Engineering Division, Louisville District, had been working closely with the Indiana Flood Control Commission prior to the hearing.

13. ARCE, 1946, p. 1678; ARCE, 1947, pp. 1741-43.

14. ARCE, 1947, pp. 1741-43; ARCE, 1950, pp. 1791-92; ARCE, 1953, pp. 1286-87; ARCE, 1955, pp. 895-96; Louisville District, *Information Bulletin*, October, 1971.

15. ARCE, 1955, pp. 892-93; Louisville District, *Project Maps and Data*, FC 133.

16. U. S., Congress, Senate, Committee on Public Works, *Rivers and Harbors - Flood Control, Hearings on H. R. 12080*, 84 Cong., 2 Sess., 1956, p. 36768; Louisville District, *Interim Report on Wabash River and Tributaries and above the Mouth of White River, Indiana for Flood Control and Allied Purposes* (pamphlet; Louisville District, 1955), *passim*; Louisville District, *Information Bulletin*, June, 1971, and July, 1971. See also pertinent volumes of ARCE and descriptions provided in Louisville District, *Project Maps and Data*. No attempt has been made herein to describe the extensive flood emergency operations of the District in the Wabash Basin, or assess the effect of repeated flood damages on public opinion along the Wabash. Suffice it to say that after the Wabash flood of 1950, in which the District saved the City of Vincennes, Indiana, by emergency work on the levees, Mayor William L. Betz wrote General Lewis A. Pick, Chief of Engineers, January 26, 1950 (copy in Ohio River Division Historical Files): "It is quite a coincidence that these same gentlemen rescued our people and city in 1943

and again so efficiently in 1950. Is it any wonder that we find it hard to express our thanks adequately?"

17. Consult descriptions of the projects named in the ARCE for 1966 through 1975, and Louisville District, *Project Maps and Data*. See also Wabash River Coordinating Committee, *Wabash River Basin Comprehensive Study* (14 volumes; Louisville District, 1971), I, *passim*.

18. U. S., Congress, Senate, Committee on Public Works, *Green River Watershed, Kentucky and Tennessee, Hearings on S. 2616*, 82 Cong., 2 Sess., 1952, pp. 16-20.

19. *Ibid.*, pp. 37-38, 60; Green River Valley Citizens League, Inc., *Flood Control - Water Storage - Green River Valley* (3 page pamphlet, dated 1956, in Manuscript Division, University of Kentucky, Lexington), *passim*.

20. Louisville District, "Improvement of the Green River for Navigation" (9 page report, 1955 (?), in Public Affairs Office, Louisville District), *passim*.

21. U. S., Congress, House, Committee on Flood Control, *Flood Control Bill of 1946, Hearings on H. R. 6597*, 79 Cong., 2 Sess., 1946, p. 220. The Barren County Superintendent of Schools who made this comment was Wilson Burks. See also U. S., Congress, House, *Barren River, Ky. and Tenn.*, H. Doc. No. 765, 78 Cong., 2 Sess., 1944, for further material revealing upstream opposition.

22. Louisville *Courier-Journal*, April 12, 1959. Details of construction of each project are furnished in ARCE for the appropriate period, and Louisville District, *Project Maps and Data*.

23. Louisville *Journal*, March 19, 1841; Louisville *Courier-Journal*, May 11, 1972.

24. ARCE, 1967, pp. 975-76; Louisville *Courier-Journal*, January 25, May 11, September 22, October 11, October 28, 1972.

25. Louisville *Courier-Journal*, November 28, December 6, 1971; *ibid.*, February 25, May 11, 1972. Mrs. Alma Stiles of Howardstown, cousin of George Stiles, a leader of opposition to the project, is quoted in Louisville *Courier-Journal*, November 28, 1971. Colonel John Rhett's comments on the 1967 hearings are printed in the same article, along with comments by Lt. Col George Shields. Louisville Deputy District Engineer, and various proponents of the Howardstown project.

26. U. S., Congress, House, *Kentucky River and Tributaries, Kentucky*, H. Doc. No. 504, 78 Cong., 2 Sess., 1944, describes early Corps planning. One of the principal objections to the Jessamine Creek project was the submerging of the site of Boonesboro. Historian Thomas D. Clark in his history of the Kentucky River commented: "The argument simmers down to the cold and practical one of which shall be served, living Kentuckians in towns like Frankfort and Louisville and those along the river or a chapter in Kentucky history which is safely recorded in historical documents high above the water line." See Thomas D. Clark, *The Kentucky*, pp. 395-96.

27. Louisville *Courier-Journal*, July 19, 1972; Louisville District, "Public Hearing for Review of the Status of the Authorized Booneville Reservoir in the Kentucky River Basin" (Transcript of hearing at Irvine, Kentucky, January 4, 1963, in Public Affairs Office, Louisville District), provides pro and con arguments on the Booneville project. See also *Estill Herald*, January 10, 1963.

28. Louisville District, "History of Louisville District, Corps of Engineers," n. p.; U. S., Congress, Senate, Committee on Public Works, *Rivers and Harbors - Flood Control*, 1962, 87 Cong., 2 Sess., 1962, pp. 340-44.

29. *Morehead News*, December 5, 1968 (see also August 12, 1965, issue); Louisville *Courier-Journal*, August 25, 1972.

30. Louisville District, "Report of Ad Hoc Committee on Cave Run Emergency, Licking River, Kentucky" (unpublished report; Louisville District, 1971), *passim*; Louisville District, *Information Bulletin*, September, 1971.

31. See reports in Louisville *Courier-Journal*, April 20, May 10, May 15, July 1, August 25, September 22, September 24, October 11, October 28, 1972.

32. ARCE, 1947, pp. 1743-44; ARCE, 1956, pp. 1041-42; Douglas L. Weart and James W. Bruce, "Ohio River Basin Flood Control Plan," *Military Engineer*, XL (August, 1948), 348-49; U. S., Congress, House, Committee on Flood Control, *Flood Control Bill of 1946, Hearings on H. R. 6597*, 79 Cong., 2 Sess., 1946, pp. 280-93.

33. ARCE, 1963, p. 1005; ARCE, 1968, p. 728.

34. See Louisville District, *Project Maps and Data*, for detailed information concerning each project.

35. *Ibid.*; ARCE, 1949, pp. 1706-07; ARCE, 1963, pp. 1001-02; Louisville District, *Information Bulletin*, September, 1971.

36. ARCE, 1945, pp. 5-6; A. L. Parson, Jr., "Recreation Facilities at Locks and Dams," *Military Engineer*, XL (October, 1948), 463.

37. "Authorities, Policies and Procedures Governing Recreational Aspects of Corps of Engineers Water Resource Development Projects" (9 page report, 1963(?), in LDHF), *passim*; U. S., Congress, Senate, Committee on Public Works, *Evaluation of Recreational Benefits from Reservoirs, Hearings on S. 1164 and S. 1221*, 85 Cong., 1 Sess., 1957, p. 15.

38. U. S., Congress, Senate, *Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources* (Supplement No. 1, June 4, 1964), S. Doc. No. 97, 87 Cong., 2 Sess., 1962, *passim*; ARCE, 1966, p. 9; Clayne R. Jensen, *Outdoor Recreation in America: Trends, Problems, and Opportunities* (Minneapolis, 1970), p. 76.

39. W. P. Leber to William F. Cassidy, July 23, 1965, copy in LDHF.

40. McMurtire, *Sketches of Louisville and Its Environs*, p. 11; ARCE, 1887, p. 1856; see also ARCE, 1896, p. 2234.

41. U. S., Congress, House, *Ohio River Pollution Control*, H. Doc. No. 266, 78 Cong., 1 Sess., 1943, pp. 14, 36-37; E. S. Tisdale, "Progress in Pollution Control in the Ohio River Basin," *Transactions of American Society of Civil Engineers*, CIV (1939), 852-59. The history of ORSANCO is reviewed in Edward J. Cleary, *The ORSANCO Story, Water Quality Management in the Ohio Valley Under an Interstate Compact* (Baltimore, 1967).

42. Brent Spence to Harry Woodring, April 7, 1937, in OCE, "Civil Works, 1923-1942, Rivers and Harbors Files," NA, RG 77; Edward M. Markham to Brent Spence, April 23, 1937, in *ibid.*

43. J. W. Arras to H. C. Newcomer, July 19, 1911, in "Press Copies of Letters . . . to the Senior Member of the Board, Located at Pittsburgh, 1911-1912," NA, RG 77; W. P. Leber to William F. Cassidy, July 23, 1965, copy in LDHF. Description of the river as a "cesspool" was common before 1960; and the author can recall, as most Ohio Valley residents can, some very unsightly conditions along the river before that date.

44. U. S., Congress, House, *Ohio River Pollution Control*, H. Doc. No. 266, 78 Cong., 1 Sess., 1943, *passim*. Any study of the problem should be initiated with a review of this report, which also provides a bibliography of pertinent sources.

45. ARCE, 1966, p. 12; General William L. Starnes, ORD, address to Engineering Association of Nashville, September 13, 1971.

## EPILOGUE: FOOTNOTES

1. William G. Berberet, "The Historical Framework of Environmental Politics" (Paper presented at Duquesne History Forum, Pittsburgh, October 29, 1971), reviews the connection between the early conservationists and modern environmentalists.

2. Louisville District, *Information Bulletin*, December, 1970; Greencastle *Daily Graphic*, July 26, 1969; "The Big Walnut," *Audubon Magazine*, September, 1969, p. 127; John T. Rhett to Director, Institute for Water Resources, n. d., in Public Affairs Office, Louisville District.

3. See note 2 above.

4. Louisville District, *Big Walnut Lake: Special Report on Alternatives* (pamphlet; Louisville District, 1972), *passim* (comments of Thomas Dustin in Exhibit 3).

5. Louisville District, *Information Bulletin*, May, 1972; "Engineers and the Environmental Movement," *Military Engineer*, LXIV (May-June, 1972), 175-76; "Engineer In-

terview: with Lieutenant General Frederick J. Clarke," *The Engineer*, I (Summer, 1971), 5.

6. See Wabash River Coordinating Committee, *Wabash River Basin Comprehensive Study* (14 volumes; Louisville District, 1971); and Ohio River Coordinating Committee, *Ohio River Basin Comprehensive Survey* (14 volumes; Cincinnati (ORD), 1969). Works which also may be consulted with profit are Wendell E. Johnson, "Water Resources Program Management," *Military Engineer*, LV (November-December, 1963), 391-92; Dewitt L. Pyburn, "Navigable Waterways and Industrial Development," *Journal of Waterways and Harbors Division, ASCE*, LXXXIII (May, 1957), Paper No. 1252; ARCE, 1951, Pt. 1 III, *passim*.

7. Corps of Engineers, Office of Appalachian Studies, *Development of Water Resources in Appalachia*, Vol. I (Cincinnati (ORD), 1969), p. xiii.